Administrator's Guide

Life Scope TR

Bedside Monitor

BSM-6301/BSM-6501/BSM-6701

BSM-6000 series
BSM-6301A
BSM-6301K
BSM-6501A
BSM-6501K
BSM-6701A
BSM-6701K

0614-901238G

NIHON KOHDEN

If you have any comments or suggestions on this manual, please contact us at: www.nihonkohden.com

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GENERAL HANDLING PRECAUTIONS

This device is intended for use only by qualified medical personnel.
Use only Nihon Kohden approved products with this device. Use of non-approved products or in a non-approved manner may affect the performance specifications of the device. This includes, but is not limited to, batteries, recording paper, pens, extension cables, electrode leads, input boxes and AC power.

Please read these precautions thoroughly before attempting to operate the instrument.

1. **To safely and effectively use the instrument, its operation must be fully understood.**

2. **When installing or storing the instrument, take the following precautions:**
   (1) Avoid moisture or contact with water, extreme atmospheric pressure, excessive humidity and temperatures, poorly ventilated areas, and dust, saline or sulphuric air.
   (2) Place the instrument on an even, level floor. Avoid vibration and mechanical shock, even during transport.
   (3) Avoid placing in an area where chemicals are stored or where there is danger of gas leakage.
   (4) The power line source to be applied to the instrument must correspond in frequency and voltage to product specifications, and have sufficient current capacity.
   (5) Choose a room where a proper grounding facility is available.

3. **Before Operation**
   (1) Check that the instrument is in perfect operating order.
   (2) Check that the instrument is grounded properly.
   (3) Check that all cords are connected properly.
   (4) Pay extra attention when the instrument is combined with other instruments to avoid misdiagnosis or other problems.
   (5) All circuitry used for direct patient connection must be doubly checked.
   (6) Check that battery level is acceptable and battery condition is good when using battery-operated models.

4. **During Operation**
   (1) Both the instrument and the patient must receive continual, careful attention.
   (2) Turn power off or remove electrodes and/or transducers when necessary to assure the patient's safety.
   (3) Avoid direct contact between the instrument housing and the patient.

5. **To Shutdown After Use**
   (1) Turn power off with all controls returned to their original positions.
   (2) Remove the cords gently; do not use force to remove them.
   (3) Clean the instrument together with all accessories for their next use.

6. **The instrument must receive expert, professional attention for maintenance and repairs. When the instrument is not functioning properly, it should be clearly marked to avoid operation while it is out of order.**

7. **The instrument must not be altered or modified in any way.**

8. **Maintenance and Inspection**
   (1) The instrument and parts must undergo regular maintenance inspection at least every 6 months.
   (2) If stored for extended periods without being used, make sure prior to operation that the instrument is in perfect operating condition.

(3) Technical information such as parts list, descriptions, calibration instructions or other information is available for qualified user technical personnel upon request from your Nihon Kohden distributor.

9. **When the instrument is used with an electrosurgical instrument, pay careful attention to the application and/or location of electrodes and/or transducers to avoid possible burn to the patient.**

10. **When the instrument is used with a defibrillator, make sure that the instrument is protected against defibrillator discharge. If not, remove patient cables and/or transducers from the instrument to avoid possible damage.**

WARRANTY POLICY

Nihon Kohden Corporation (NKC) shall warrant its products against all defects in materials and workmanship for one year from the date of delivery. However, consumable materials such as recording paper, ink, stylus and battery are excluded from the warranty.

NKC or its authorized agents will repair or replace any products which prove to be defective during the warranty period, provided these products are used as prescribed by the operating instructions given in the operator's and service manuals.

No other party is authorized to make any warranty or assume liability for NKC's products. NKC will not recognize any other warranty, either implied or in writing. In addition, service, technical modification or any other product change performed by someone other than NKC or its authorized agents without prior consent of NKC may be cause for voiding this warranty.

Defective products or parts must be returned to NKC or its authorized agents, along with an explanation of the failure. Shipping costs must be pre-paid.

This warranty does not apply to products that have been modified, disassembled, reinstalled or repaired without Nihon Kohden approval or which have been subjected to neglect or accident, damage due to accident, fire, lightning, vandalism, water or other casualty, improper installation or application, or on which the original identification marks have been removed.

In the USA and Canada other warranty policies may apply.

CAUTION

United States law restricts this product to sale by or on the order of a physician.

EMC RELATED CAUTION

This equipment and/or system complies with IEC 60601-1-2 International Standard for electromagnetic compatibility for medical electrical equipment and/or system. However, an electromagnetic environment that exceeds the limits or levels stipulated in IEC 60601-1-2, can cause harmful interference to the equipment and/or system or cause the equipment and/or system to fail to perform its intended function or degrade its intended performance. Therefore, during the operation of the equipment and/or system, if there is any undesired deviation from its intended operational performance, you must avoid, identify and resolve the adverse electromagnetic effect before continuing to use the equipment and/or system.

The following describes some common interference sources and remedial actions:

1. Strong electromagnetic interference from a nearby emitter source such as an authorized radio station or cellular phone:
   Install the equipment and/or system at another location. Keep the emitter source such as cellular phone away from the equipment and/or system, or turn off the cellular phone.

2. Radio-frequency interference from other equipment through the AC power supply of the equipment and/or system:
   Identify the cause of this interference and if possible remove this interference source. If this is not possible, use a different power supply.

3. Effect of direct or indirect electrostatic discharge:
   Make sure all users and patients in contact with the equipment and/or system are free from direct or indirect electrostatic energy before using it. A humid room can help lessen this problem.

4. Electromagnetic interference with any radio wave receiver such as radio or television:
   If the equipment and/or system interferes with any radio wave receiver, locate the equipment and/or system as far as possible from the radio wave receiver.

5. Interference of lightning:
   When lightning occurs near the location where the equipment and/or system is installed, it may induce an excessive voltage in the equipment and/or system. In such a case, disconnect the AC power cord from the equipment and/or system and operate the equipment and/or system by battery power, or use an uninterruptible power supply.

6. Use with other equipment:
   When the equipment and/or system is adjacent to or stacked with other equipment, the equipment and/or system may affect the other equipment. Before use, check that the equipment and/or system operates normally with the other equipment.

7. Use of unspecified accessory, transducer and/or cable:
   When an unspecified accessory, transducer and/or cable is connected to this equipment and/or system, it may cause increased electromagnetic emission or decreased electromagnetic immunity. The specified configuration of this equipment and/or system complies with the electromagnetic requirements with the specified configuration. Only use this equipment and/or system with the specified configuration.

Caution - continued

8. Use of unspecified configuration:
   When the equipment and/or system is used with the unspecified system configuration different than the configuration of EMC testing, it may cause increased electromagnetic emission or decreased electromagnetic immunity. Only use this equipment and/or system with the specified configuration.

9. Measurement with excessive sensitivity:
   The equipment and/or system is designed to measure bioelectrical signals with a specified sensitivity. If the equipment and/or system is used with excessive sensitivity, artifact may appear by electromagnetic interference and this may cause mis-diagnosis. When unexpected artifact appears, inspect the surrounding electromagnetic conditions and remove this artifact source.

If the above suggested remedial actions do not solve the problem, consult your Nihon Kohden distributor or representative for additional suggestions.

In IEC 60601-1-2 Medical Electronic Equipment, Part 1: General Requirements for Safety, 2. Collateral Standard: Electromagnetic compatibility-Requirements and test. Section 36. 202. 2 Radiated radio-frequency electromagnetic fields, PATIENT COUPLED EQUIPMENT and/or SYSTEMS applicable IMMUNITY test methods are under consideration at SC62A/WG13. The 3 V/m IMMUNITY level may be inappropriate especially when measuring SpO_2 because physiological signals can be much smaller than those induced by a 3 V/m electromagnetic field.

When measuring SpO_2, various interference may produce false waveforms which look like pulse waveforms. SpO_2 value and pulse rate may be measured from these false waveforms, causing the alarm to function improperly.

When installing the monitor, avoid locations where the monitor may receive strong electromagnetic interference such as radio or TV stations, cellular phone or mobile two-way radios.

WARNING

Interaction Between Minute Ventilation Rate-Adaptive Pacemakers and Cardiac Monitoring and Diagnostic Equipment*

The bioelectric impedance measurement sensor of a minute ventilation rate-adaptive implantable pacemaker may be affected by cardiac monitoring and diagnostic equipment which is connected to the same patient. If this occurs, the pacemaker may pace at its maximum rate and give incorrect data to the monitor or diagnostic equipment. If this occurs, disconnect the monitor or diagnostic equipment from the patient or change the setting on the pacemaker by referring to the pacemaker's manual. For more details, contact your pacemaker representative or Nihon Kohden representative.

* Minute ventilation is sensed in rate-adaptive pacemakers by a technology known as bioelectric impedance measurement (BIM). Many medical devices in addition to pacemakers use this technology. When one of these devices is used on a patient with an active, minute ventilation rate-adaptive pacemaker, the pacemaker may erroneously interpret the mixture of BIM signals created in the patient, resulting in an elevated pacing rate.

  For more information, see the FDA web site.
  http://www.fda.gov/cdrh/safety.html

Conventions Used in this Manual and Instrument

Warnings, Cautions and Notes

Warnings, cautions and notes are used in this manual to alert or signal the reader to specific information.

WARNING

A warning alerts the user to possible injury or death associated with the use or misuse of the instrument.

CAUTION

A caution alerts the user to possible injury or problems with the instrument associated with its use or misuse such as instrument malfunction, instrument failure, damage to the instrument, or damage to other property.

NOTE

A note provides specific information, in the form of recommendations, prerequirements, alternative methods or supplemental information.

Related Documentation

The BSM-6000A/K series Bedside Monitor comes with the following manuals in addition to the Operator's Manual.

Administrator's Guide

Describes how to install the bedside monitor. It also explains about the password protected settings on the SYSTEM SETUP window and SYSTEM CONFIGURATION screen which only an administrator can change.

User's Guide, Part I

Gives supplemental information on the operation of the bedside monitor.

User's Guide, Part II

Describes the features and settings of the monitoring parameters.

Service Manual

Describes information on servicing the bedside monitor. Only qualified service personnel can service the bedside monitor.

Safety Standards

The safety standard of this bedside monitor is classified as follows:

Type of protection against electrical shock: CLASS I EQUIPMENT (AC Powered)
Internally Powered EQUIPMENT (BATTERY Powered)

Degree of protection against electrical shock

Defibrillator-proof type CF applied part

AY-631P, AY-633P, AY-651P, AY-653P, AY-661P, AY-663P, AY-671P and AY-673P:
ECG, Respiration (impedance and thermistor method), IBP, Temperature, SpO_2, CO_2, O_2, NIBP, BIS

AY-660P: ECG, Respiration (impedance method), IBP, Temperature, SpO_2, CO_2, NIBP

AA-672P and AA-674P: Respiration (thermistor method), IBP, Temperature, SpO_2, CO_2, O_2, BIS

CF applied part:

AY-631P, AY-633P, AY-651P, AY-653P, AY-661P, AY-663P, AY-671P, AY-673P, AA-672P and AA-674P: CO

Degree of protection against harmful ingress of water: IPX0 (non-protected)

Degree of safety of application in the presence of FLAMMABLE ANAESTHETIC MIXTURE WITH AIR, OR WITH OXYGEN OR NITROUS OXIDE:

Equipment not suitable for use in the presence of FLAMMABLE ANAESTHETIC MIXTURE WITH AIR, OR WITH OXYGEN OR NITROUS OXIDE

Mode of operation: CONTINUOUS OPERATION

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This section describes installation conditions, connecting cables and power cords and check items for this bedside monitor.

For simplicity, the suffix A/G/K will be omitted in this manual. There is no difference in operation among models with different suffixes unless otherwise specified.

Installation Conditions

Note the following points for the installation location of your bedside monitor.

WARNING

- Do not install the monitor and optional units above the patient.
- Only use the specified tools or equipment when installing the monitor and units. Failure to follow this warning may result in the monitor or unit falling and injuring the patient.

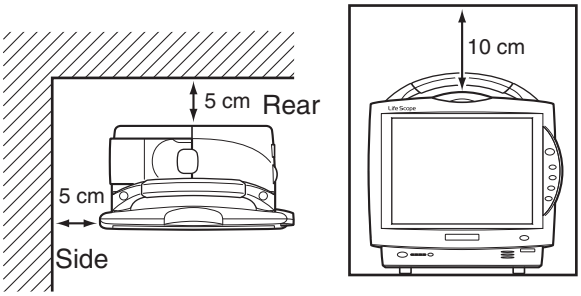
CAUTION

Only use the specified stand, cart or equipment for installing the monitor and instruments. Using non-specified equipment may result in the instruments falling and causing injury.

CAUTION

When not using the specified cart, carefully set the monitor to prevent it from falling off or tipping over.

- Install the monitor where you can see the monitor screen clearly.
- Install the monitor on a strong shelf or dedicated cart (option). Secure the monitor to the shelf to prevent it from falling.
- When moving a cart with a monitor, avoid collision. Strong impact may damage the monitor.
- The monitor is not intended to be used in an ambulance. The monitor might not function properly in a moving vehicle.
- The display screen is made of glass. Strong impact may damage it.
- Avoid locations where the monitor is sprinkled with liquid. Avoid direct sprinkling, spray or moist air from a nebulizer or a humidifier.
- Avoid exposing the monitor to direct sunlight.
- Make sure that there is at least 5 cm of space between the monitor and the wall for adequate ventilation. When the monitor is surrounded on all sides, make sure that there is about 10 cm of space above the monitor for ventilation so that the operating temperature does not exceed 40°C (104°F).



- Do not cover the monitor with a blanket or cloth. It may affect monitoring.
- Do not install the monitor in a dusty area.
- Connect the power cord to an AC outlet which can supply enough AC current to the monitor. The monitor cannot function properly with low current.
- When there is any problem on the monitor, turn off the power immediately and disconnect the power cord from the AC outlet. Take the monitor out of service and check for damage.

Optional Cart for the Bedside Monitor

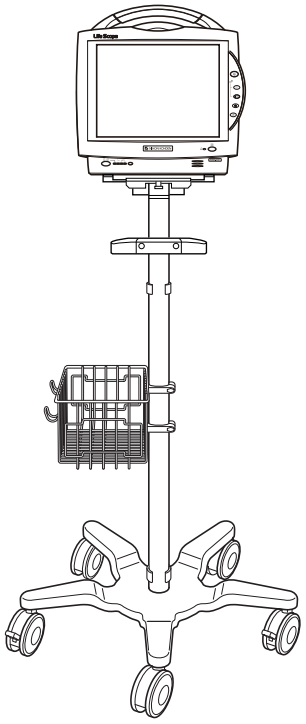
The KC-600P cart is available for installing the monitor. For details on how to use the cart, refer to the KC-600P cart installation guide.

CAUTION

Only use the specified stand, cart or equipment for installing the monitor and instruments. Using non-specified equipment may result in the instruments falling and causing injury.

CAUTION

When not using the specified cart, carefully set the monitor to prevent it from falling off or tipping over.



Optional Wall Mount Kit for the Bedside Monitor

The KG-951P wall mount kit is available for mounting the monitor on a wall. For details on how to use the wall mount kit, refer to the KG-951P wall mount kit installation guide.

Installation Flowchart

You may not need to do all these.

1. Install the monitor. Refer to Section 1 in this manual.

2. Prepare the battery pack, remote control and recorder. Refer to Operator's Manual or Section 2 of the User's Guide Part I.

3. Check or change any initial settings on the SYSTEM CONFIGURATION screen. Changing these settings during monitoring interrupts monitoring. Refer to Section 2 in this manual.

4. Check or change any initial settings on the SYSTEM SETUP window. These settings are password protected settings which only an administrator can change. Refer to Section 3 in this manual.

5. Check or change the necessary settings before monitoring. Refer to Operator's Manual or Section 3 of the User's Guide Part I.
   - Date and time
   - Sound volume
   - Screen brightness
   - Waveform display settings

6. Enter the information of the new patient. Refer to "Entering Patient Information" in Operator's Manual or Section 3 of the User's Guide Part I.

7. Check or change all alarm items for the patient. When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON, the alarm settings return to the default settings 30 minutes after the monitor is turned off. When <AUTO ADMIT> is set to OFF, you can select whether to save the settings or initialize the master settings. Refer to Operator's Manual or Section 5 of the User's Guide Part I.

8. Check or change settings for the review windows, such as trendgraphs, tables and arrhythmia recall files. Refer to Operator's Manual or Section 6 of the User's Guide Part I.

9. Check or change recording settings. Refer to Operator's Manual or Section 10 of the User's Guide Part I.

10. Prepare the equipment (electrodes, transducers, probes, etc.) for monitoring individual parameters and check or change the settings for each parameter. Refer to Operator's Manual or User's Guide Part II.

Installing the Optional Units to the Monitor and Connecting External Instruments

WARNING

Connect only the specified instrument to the monitor and follow the specified procedure. Failure to follow this warning may result in electrical shock or injury to the patient and operator, and cause fire or instrument malfunction.

WARNING

When several medical instruments are used together, ground all instruments to the same one-point ground. Any potential difference between instruments may cause electrical shock to the patient and operator.

CAUTION

Before connecting or disconnecting instruments, make sure that each instrument is turned off and the power cord is disconnected from the AC socket. Otherwise, the patient or operator may receive electrical shock or injury.

NOTE

- For details on connecting an external instrument to the monitor, contact your Nihon Kohden representative.
- Leakage current may increase when interconnecting many medical instruments to the monitor.
- Upgrade the main unit and each optional unit to the Nihon Kohden recommended software version. Only use the specified configuration of units. If more than one BSM-6000 series bedside monitor is used in the same facility, make sure the bedside monitors have the same software version. If BSM-6000 series monitors with different software versions are used together, correct system operation cannot be guaranteed.

Additional Safety Measures for Connecting External Instruments

When more than one electrical instrument is used, there may be electrical potential difference between the instruments. Potential difference between instruments may cause current to flow to the patient connected to the instruments, resulting in electrical shock (micro shock). Never use any medical equipment in patient treatment without proper grounding.

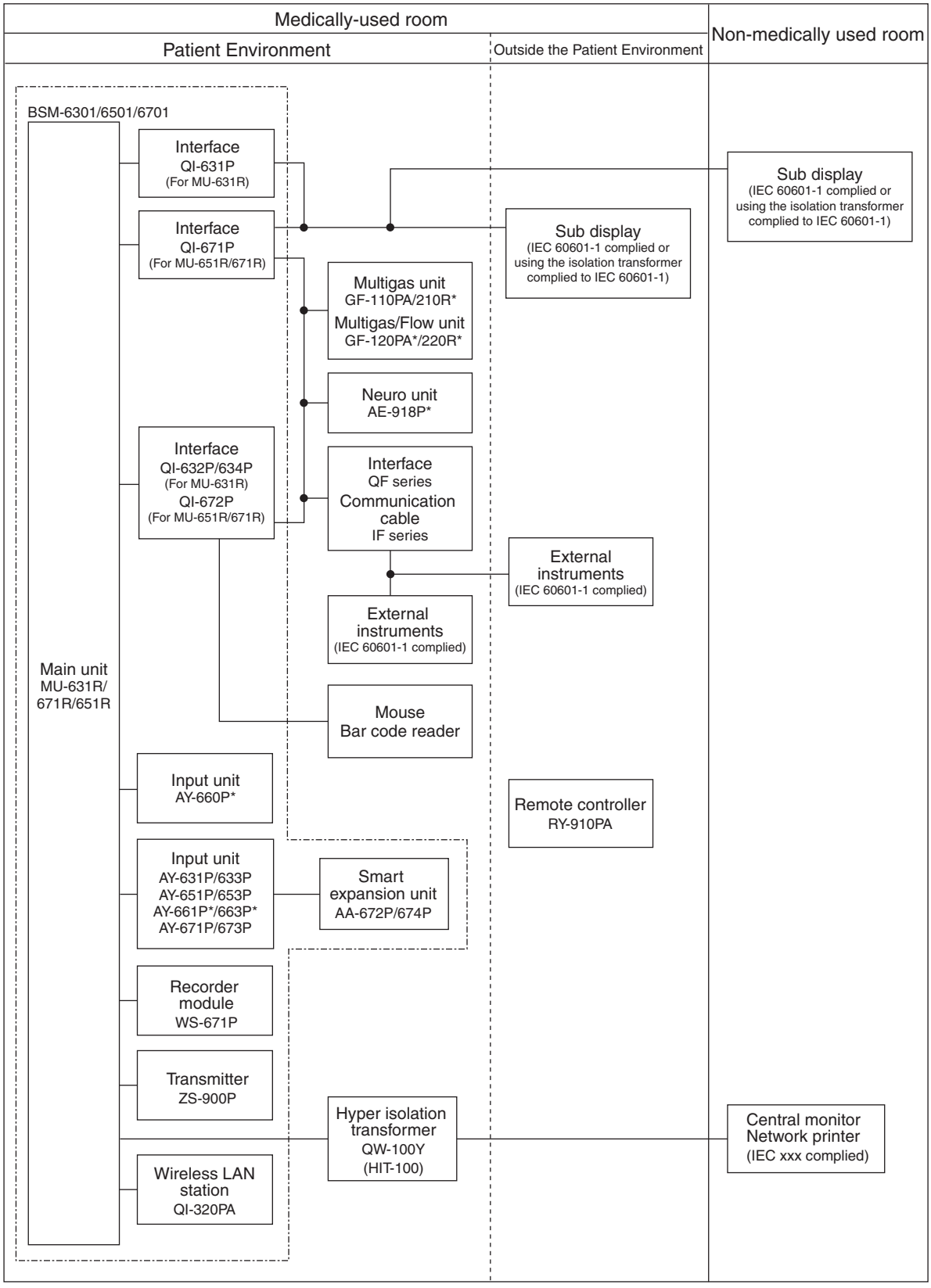
Always perform equipotential grounding as specified in IEC 60601-1-1 when required. It is often required in the operating room, ICU room, CCU room, cardiac catheterization room and X-ray room. Consult with a biomedical engineer to determine if it is required.

Refer to the reference “General Requirements for Connecting Medical Electrical Systems” in Section 4.

Environment for External Instruments

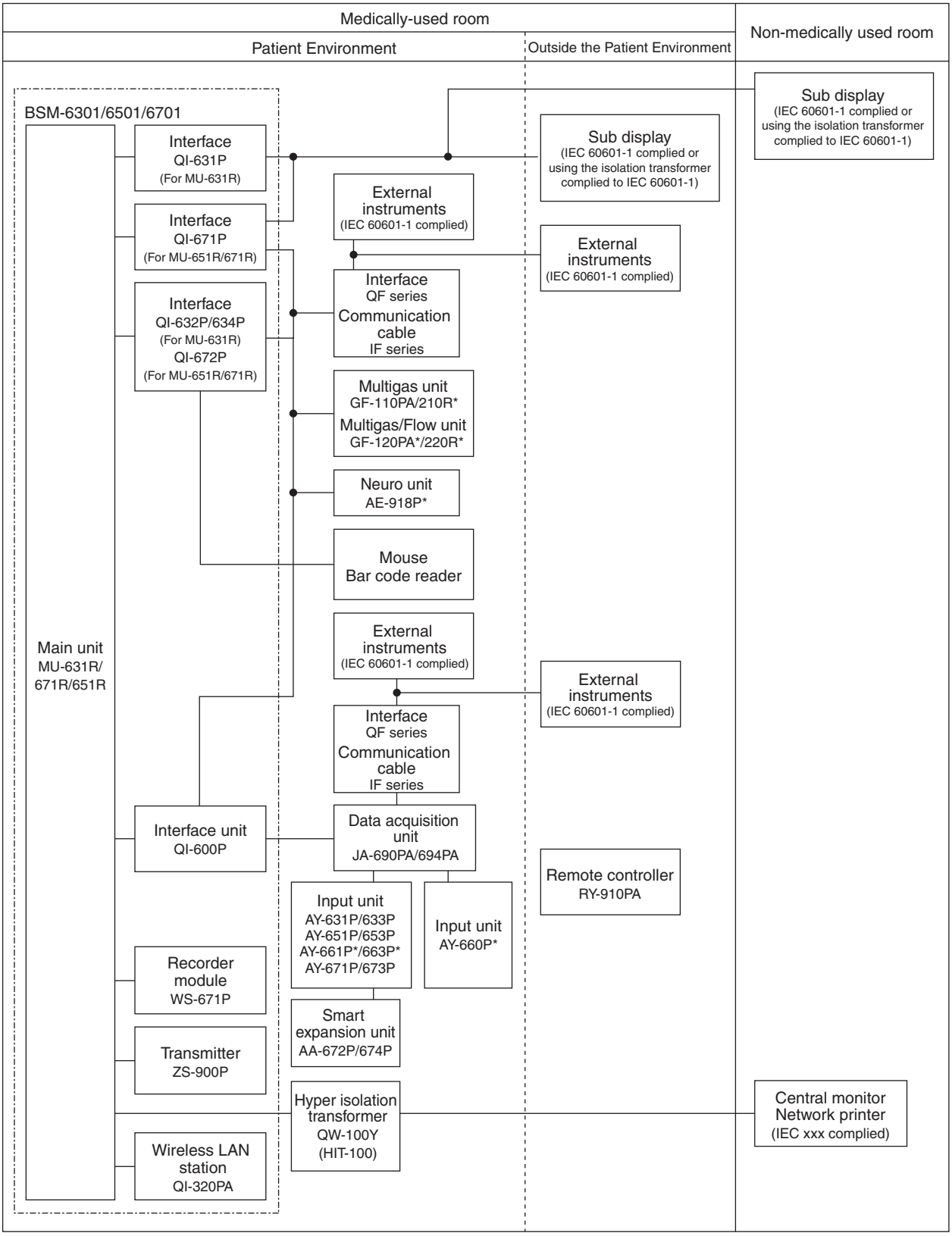
Use external instruments in the following environment.

When a JA-690PA/JA-694PA data acquisition unit is not connected to the bedside monitor



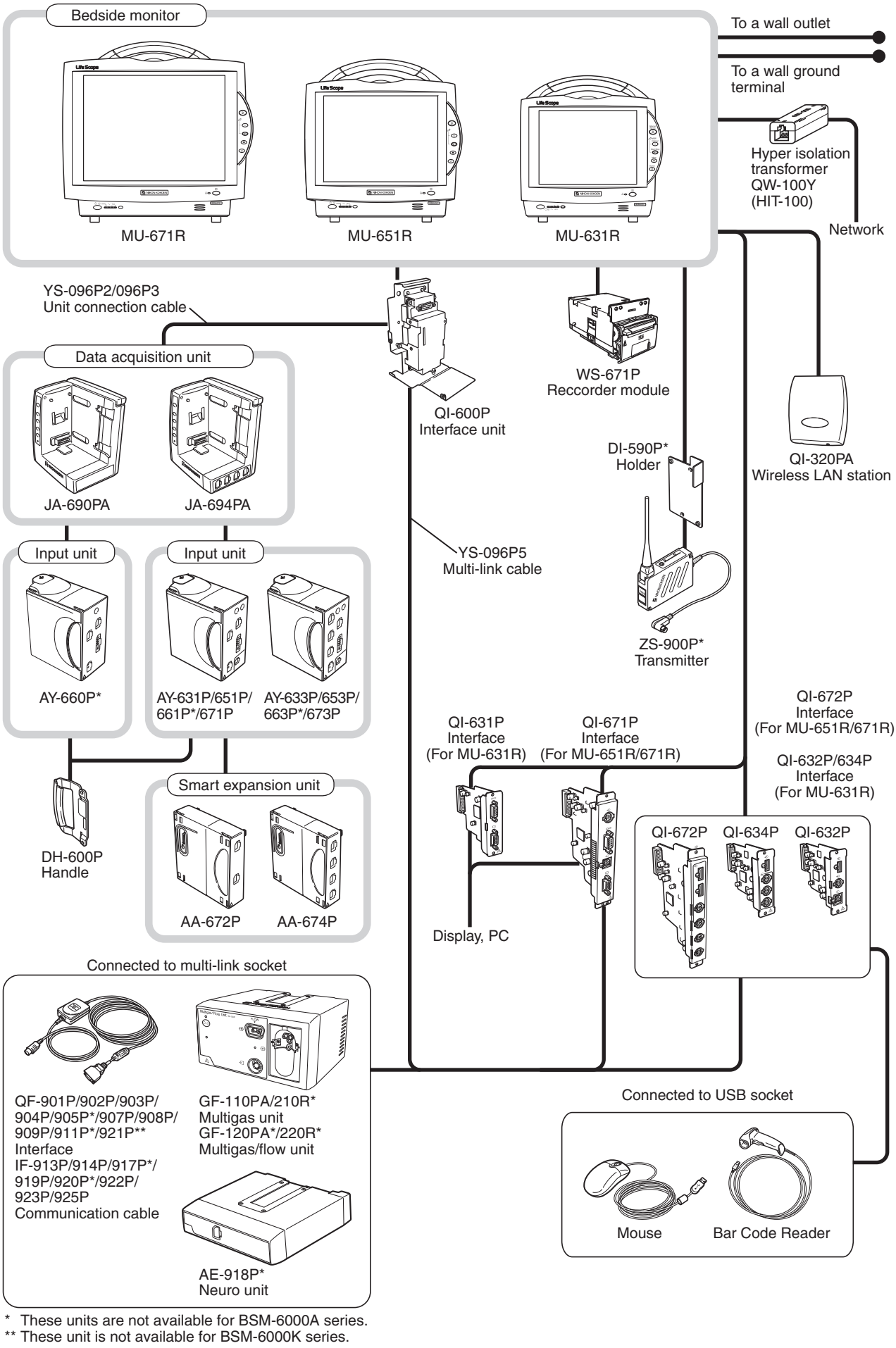
* These units are not available for BSM-6000A series.

When a JA-690PA/JA-694PA data acquisition unit is connected to the bedside monitor



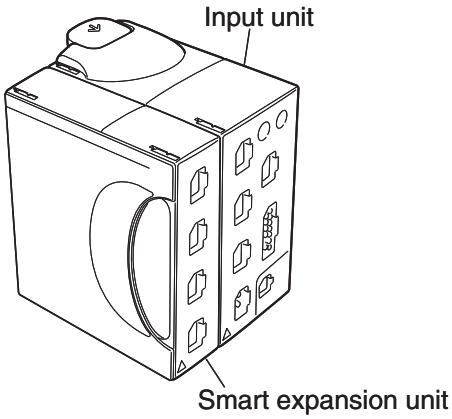
* These units are not available for BSM-6000A series.

Connection Overview



* These units are not available for BSM-6000A series.
** These unit is not available for BSM-6000K series.

Attaching the AA-672P or AA-674P Smart Expansion Unit to the AY series Input Unit



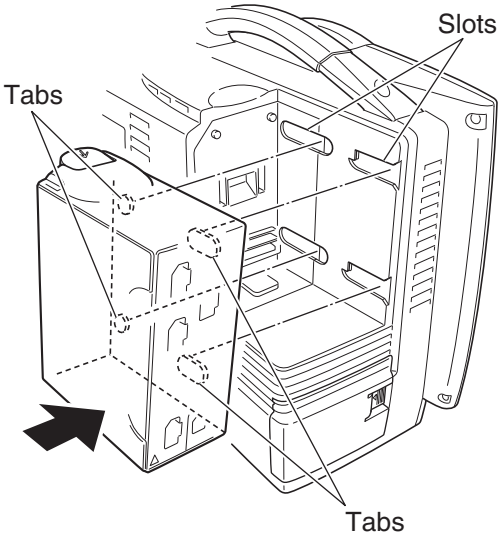
Attach the smart expansion unit to the input unit before mounting the input unit onto the monitor. Only one smart expansion unit can be attached to the input unit. For details on how to attach the smart expansion unit, refer to the manual provided with the unit.

NOTE

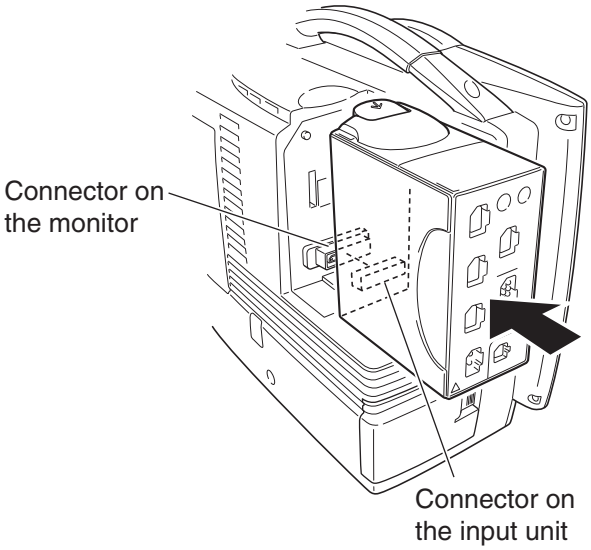
The AA-672P or AA-674P smart expansion unit does not function when it is attached to the AY-660P input unit.

Mounting the AY series Input Unit onto the Monitor

1. Mount the input unit onto the rear of the monitor so that the tabs on the input unit go into the slots on the monitor.

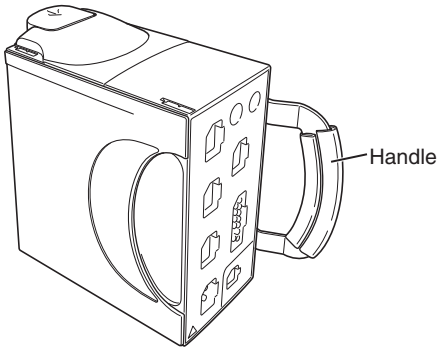


2. Slide the input unit in the direction of the arrow until it clicks into place.

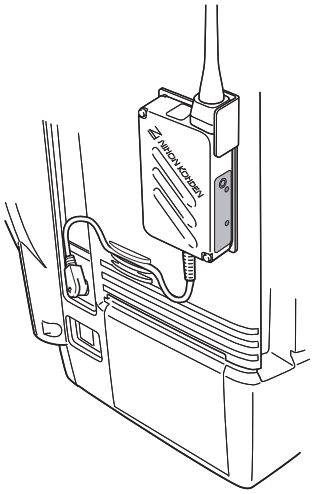


Using an Optional Handle

A DH-600P handle can be attached to the input unit so that the input unit can be removed from the main unit and carried around easily. For details on the handle, refer to the manual provided with the handle.



Attaching the ZS-900P Transmitter

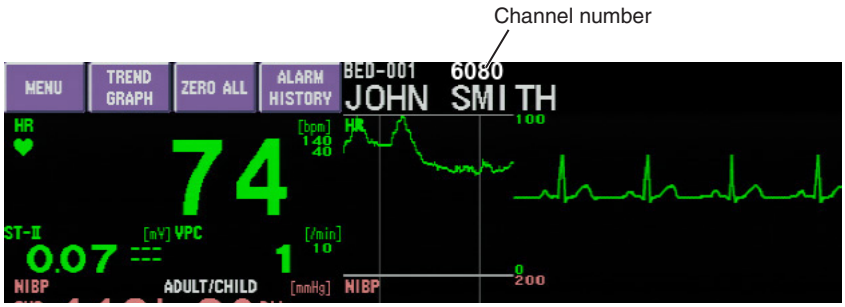


ZS-900P transmitter and DI-590P holder are not available for BSM-6000A series.

The ZS-900P transmitter transmits data from the monitor to a cardiac telemetry system or central monitor. A multiple patient receiver is necessary with the central monitors.

To connect the transmitter to the monitor, the optional DI-590P holder is required. Connect the transmitter to the monitor by referring to the DI-590P holder installation guide.

When the transmitter is connected to the monitor, turn the monitor power on and check that the LED on the transmitter lights in green. Also check that the channel number displayed in the upper part of the screen is correct.



CAUTION

When using a ZS-900P transmitter, the measurement values and displayed waveform on the bedside monitor and receiving monitor may differ due to timing delay of the display and other factors. Be careful when reading the value and waveform.

CAUTION

When the ZS-900P transmitter is attached to the bedside monitor, check the alarm, arrhythmia and monitoring settings on the central monitor or telemetry system. The transmitter does not transmit the alarm, arrhythmia and monitoring setting information.

CAUTION

The ZS-900P transmitter can only transmit temperature data from 5 to 45°C (41 to 113°F). Be careful when reading the value.

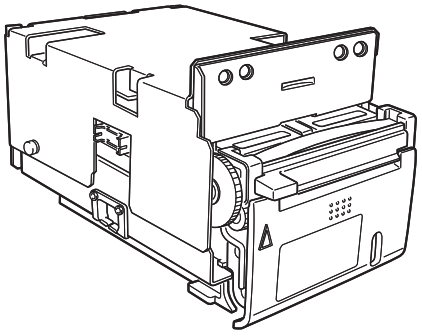
CAUTION

The ZS-900P transmitter can only transmit CO_2 data from 0 to 100 mmHg (0 to 13.3 kPa). When the transmitting data is out of this range, the receiving monitor displays it as 100 mmHg. Be careful when reading the value.

NOTE

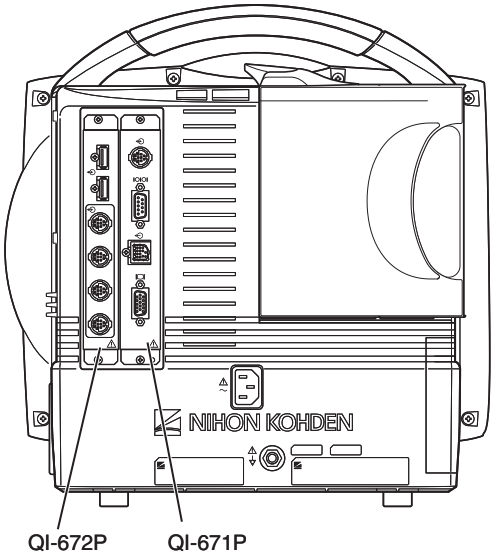
- Before connecting the transmitter, turn off the monitor power.
- The ZS-900P transmitter does not comply with the CE mark.
- A ZB-800P or ZB-900P transmitter cannot be used on this monitor.

Installing the WS-671P Recorder Module



Install the optional WS-671P recorder module in the monitor by referring to the WS-671P recorder module installation guide. To load the recording paper, refer to Operator's Manual or Section 2 of the User's Guide Part I.

Installing the QI-631P, QI-632P, QI-634P, QI-671P or QI-672P Interface



When the interface is installed in the monitor, external instruments can be connected to the monitor.

The illustration on the left shows both the QI-671P and QI-672P interfaces are installed in the BSM-6701 bedside monitor.

The interface has 2, 3, 4 or 6 sockets.
For BSM-6301:

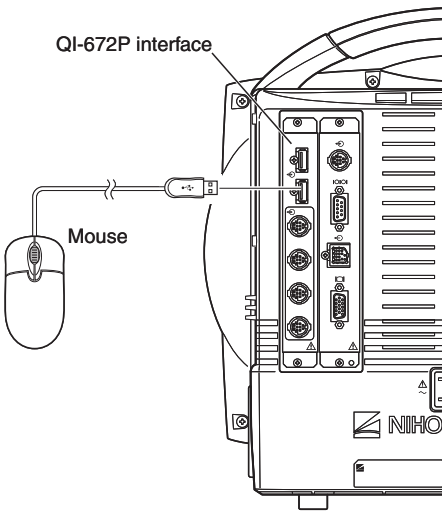
- QI-631P: RS-232C, RGB
- QI-632P: USB, multi-link, alarm signal output
- QI-634P: USB, multi-link

For BSM-6501 and BSM-6701:

- QI-671P: Multi-link, RS-232C, alarm signal output, RGB
- QI-672P: 2 USB, 4 multi-link

Install the optional interface in the monitor by referring to the manual provided with the interface.

Connecting the Mouse

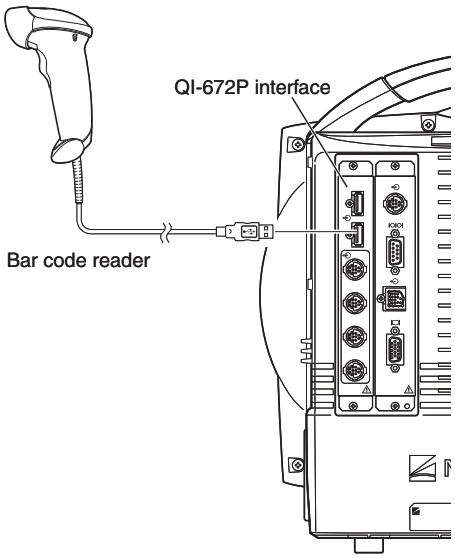


To connect the mouse, the QI-632P, QI-634P or QI-672P interface is required. The QI-632P and QI-634P interfaces are for BSM-6301. The QI-672P interface is for BSM-6501 and BSM-6701.

The illustration on the left shows both the QI-672P and QI-671P interfaces are installed in the BSM-6701 bedside monitor.

Connect the mouse cable to the USB socket on the interface which is installed in the monitor.

Connecting the Bar Code Reader



To connect the bar code reader, the QI-632P, QI-634P or QI-672P interface is required. The QI-632P and QI-634P interfaces are for BSM-6301. The QI-672P interface is for BSM-6501 and BSM-6701.

The illustration on the left shows both the QI-672P and QI-671P interfaces installed in the BSM-6701 bedside monitor.

Connect the bar code reader cable to the USB socket on the interface which is installed in the monitor.

Refer to the “Setting the Bar Code Reader” later in this section for setting the bar code reader.

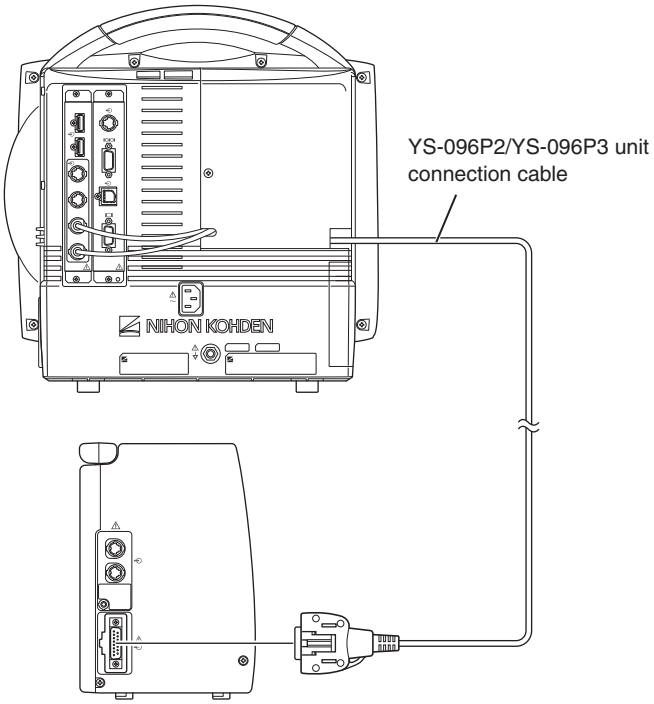
Connecting the JA-690PA or JA-694PA Data Acquisition Unit

To connect the JA-690PA or JA-694PA data acquisition unit, the YS-096P2 or YS-096P3 unit connection cable is required. Connect the cable to the bedside monitor and to the unit connection socket on the data acquisition unit.

For details on how to use the data acquisition unit, refer to the data acquisition unit operator's manual.

NOTE

- Connect the unit connection cable to the unit connection socket on the data acquisition unit straight until it locks firmly.
- Keep the cable out of the way by running it along the floor or wall. Otherwise people may trip over it, causing the instrument to fall and injure the patient and operator.



Connecting External Instruments

To connect the external instruments, the QI-632P or QI-634P interface for BSM-6301 or QI-671P or QI-672P interface for BSM-6501 and BSM-6701 must be installed in the monitor.

Connecting a GF-110PA or GF-210R Multigas Unit, GF-120PA or GF-220R Multigas/Flow Unit or AE-918P Neuro Unit

NOTE

GF-210R multigas unit, GF-120PA or GF-220R multigas/flow unit and AE-918P neuro unit are not available for the BSM-6000A series.

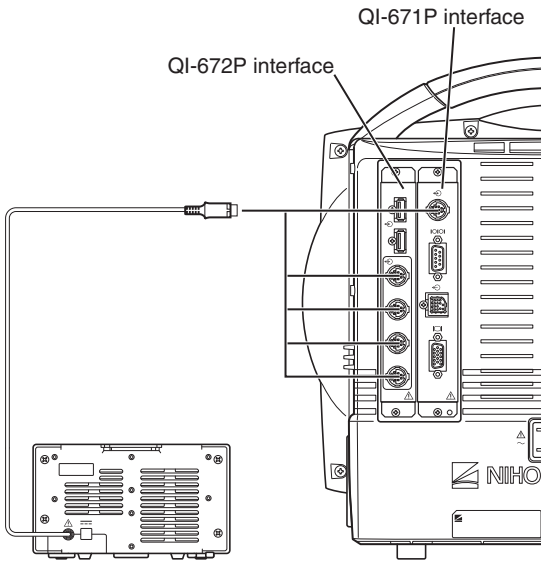
Connect the GF-110PA or GF-210R multigas unit, GF-120PA or GF-220R multigas/flow unit or AE-918P neuro unit to one of the multi-link sockets on the QI-632P, QI-634P, QI-671P or QI-672P interface.

NOTE

When a multigas unit or multigas/flow unit is connected to the monitor and the monitor is in operation, do not connect any other instrument to the monitor with a multi-link cable. If another multi-link cable is connected to the main unit during operation, the multigas unit or multigas/flow unit may enter warmup status and automatically restart monitoring 45 seconds (AG-920R, GF-110PA, GF-120PA) or 6 minutes (GF-210R, GF-220R) after warmup.

The following example shows both the QI-671P and QI-672P interfaces installed in the BSM-6701 bedside monitor and a GF-120PA multigas/flow unit connected.

Connecting Example



GF-120PA multigas/flow unit

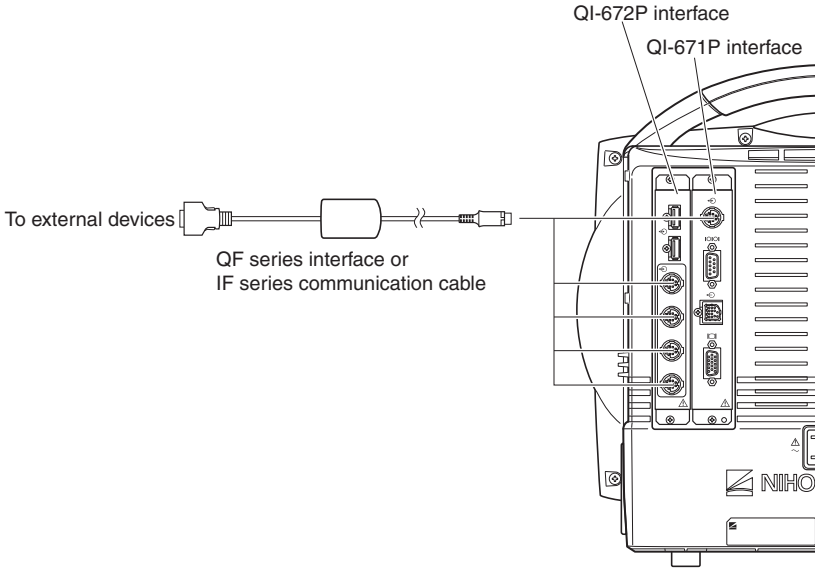
Connecting an External Instrument Using a QF Series Interface or IF Series Communication Cable

Connect the QF series interface cable or IF series communication cable to the external instrument and to one of the multi-link sockets on the QI-632P, QI-634P, QI-671P or QI-672P interface.

The following example shows both the QI-671P and QI-672P interfaces installed in the BSM-6701 bedside monitor.

NOTE

Do not connect or remove the QF series interface or IF series communication cable connector while the monitor power is on. The monitor might not function properly.



Connecting a Sub Display

A sub display can be connected to the bedside monitor. Connect the sub display to the RGB socket on the QI-631P interface for a BSM-6301 bedside monitor or to the QI-671P interface for a BSM-6501 or BSM-6701 bedside monitor. The sub display must meet the following specifications. An NEC LCD191VXM or equivalent display is recommended.

Minimum specifications for BSM-6701 display:

- Resolution: 1024 × 768
- Input Analog RGB: 0.7 Vp-p
- V-sync: 60.0 Hz
- H-sync: 48.4 kHz

Minimum specifications for BSM-6301 and BSM-6501 display:

- Resolution: 800 × 600
- Input Analog RGB: 0.7 Vp-p
- V-sync: 60.3 Hz
- H-sync: 37.9 kHz

To connect the display to the interface, use the YS-080P3 RGB cable (10 m). The sub display must be connected to the SM-800R isolation transformer.

The screen to be displayed on the sub display can be set to either of the following on the DISPLAY page of the SYSTEM SETUP window. Refer to Section 3.

- SLAVE: Same screen as the bedside monitor.
- HOME SCREEN: The home screen is always displayed.

Connecting the Power Cord and Grounding Lead

General

The monitor can operate on either battery or AC power.

When the power cord is plugged into an AC outlet and the power switch on the front panel is turned on, the monitor operates on AC power.

When a battery pack is inserted and the power cord is disconnected or there is a sudden power failure, the monitor automatically switches to battery power.

The battery pack is charged when the power cord is plugged into an AC outlet and the AC current is supplied to the monitor. The battery pack is also charged during monitoring.

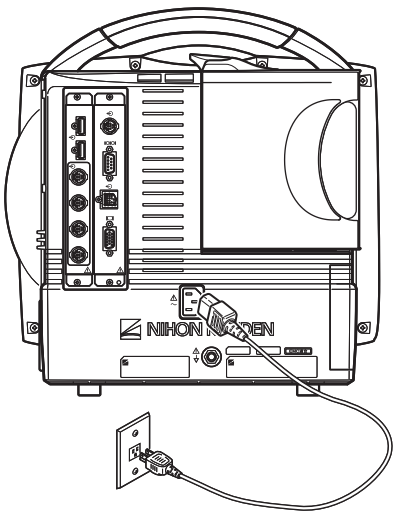
The monitor can operate for about 60 minutes on the BSM-6301 and BSM-6501 or about 45 minutes on the BSM-6701 with a new fully charged battery pack when:

- Used in normal temperature.
- Recorder is stopped.
- No alarm occurs.
- Monitoring ECG, respiration (impedance) and SpO_2.
- <POWER SAVING MODE> on the SYSTEM SETUP window is set to ON.
- <SYNC SOUND VOLUME> on the VOLUME window is set to OFF.
- NIBP measurement interval is 15 minutes.
- QI-671P and QI-672P interfaces or QI-631P and QI-632P or QI-634P interfaces are installed in the monitor.

Connecting the Power Cord

WARNING

Only use the provided power cord. Using other power cords may result in electrical shock or injury to the patient and operator.

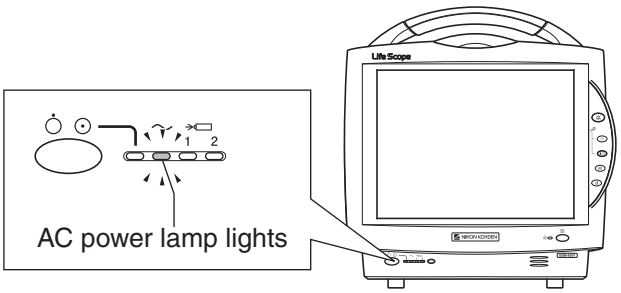


Connect the provided power cord to the AC SOURCE socket on the rear panel of the monitor and plug the cord into a 3-prong AC outlet.

When AC power is supplied to the monitor, the AC power lamp on the front panel lights.

NOTE

If the AC power lamp does not light, check the power cord connection.



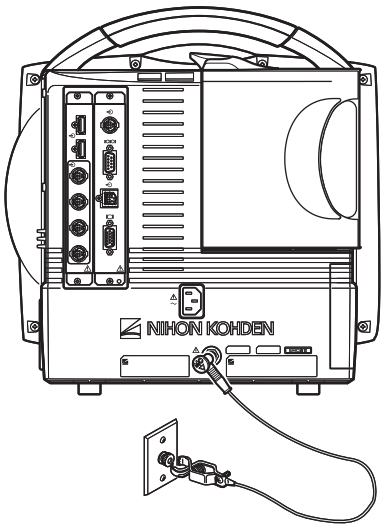
Grounding the Monitor

WARNING

When several medical instruments are used together, ground all instruments to the same one-point ground. Any potential difference between instruments may cause electrical shock to the patient and operator.

When more than one electrical instrument is used, there may be electrical potential difference between the instruments. The potential difference between the instruments may cause current to flow to the patient connected to the instruments, resulting in electrical shock (micro shock).

Always perform equipotential grounding when required. It is often required in the operating room, ICU room, CCU room, cardiac catheterization room and X-ray room. Consult with a biomedical engineer to determine if it is required.



When equipotential grounding is required, connect the equipotential ground terminal on the instrument to the equipotential ground terminal on the wall (equipotential grounding system) with the equipotential grounding lead (potential equalization conductor).

Connecting the Monitor to the Network

The network connection method differs according to the installation location of the monitor and the network components. The network connection must comply with IEC 60601-1-1 “General Requirements for Safety of Medical Electrical Equipment”. For details, refer to the “Network and System Installation Guide” which is available from your Nihon Kohden representative.

WARNING

Connect the monitor to network as specified. Otherwise the patient and operator may receive electrical shock or injury. To connect the network, contact your Nihon Kohden representative.

WARNING

In a network where this monitor is connected, connect only the specified instruments. Unspecified instruments may cause electrical shock or injury to the patient and operator or cause instrument malfunction, instrument stop, or data loss.

WARNING

Install all network devices, including printer and hubs, outside the patient environment (IEC 60601-1-1). If they are installed inside the patient environment, the patient or operator may receive electrical shock or injury. For installation, contact your Nihon Kohden representative.

WARNING

Check the software version number of the monitor before connecting it to the network. Different software versions have different communication methods. More than one communication method in a network may cause communication failure. For details, refer to the Network and System Installation Guide.

Connecting the QW-100Y (HIT-100) Hyper Isolation Transformer

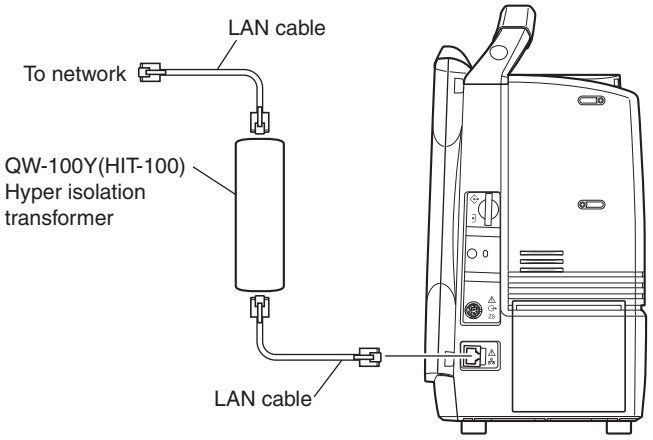
Connect the monitor to the network with the specified LAN cable. Connect the QW-100Y (HIT-100) hyper isolation transformer between the monitor and network.

WARNING

Do not use a damaged network cable. The patient or operator may receive electrical shock when the damaged part is touched.

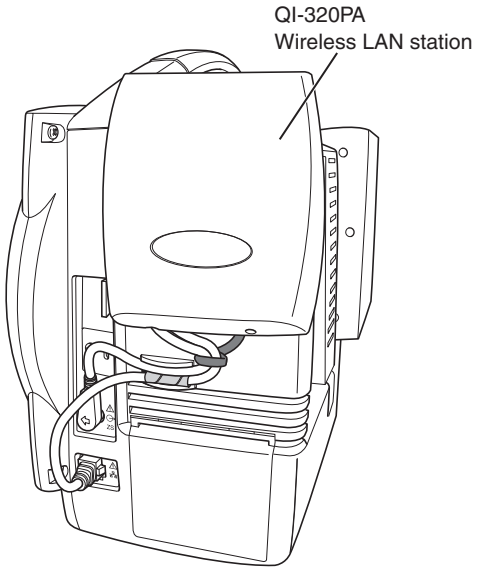
NOTE

The time on this monitor is automatically adjusted to match the time of the network as long as the monitor is connected to the network. The date and time on all monitors in the network are set to the same setting.



Connecting the QI-320PA Wireless LAN Station

Connect the QI-320PA wireless LAN station to the bedside monitor with a specified wireless LAN access point. Refer to the QI-320PA wireless LAN station operator's manual.



Turning the Power On/Off

Check Before Turning On the Power

Check the following items before turning on the power.

- Enough electrodes and electrode leads are ready.
- Cleaned and sterilized sensors and transducers are ready.
- Power cord is connected properly.
- Equipotential grounding lead is connected properly when equipotential grounding is required.
- All cables are connected properly.
- Enough recording paper in the recorder (when using an optional recorder).
- Fully charged battery pack is installed in the monitor in case of a sudden power failure.
- No scratches, damage or dirt on the monitor.
- No damage to the keys and panels.
- No damage to the power cord.
- No damage to the electrode leads, transducers, probes and cables.
- The monitor is not in a wet place.

Turning the Power On

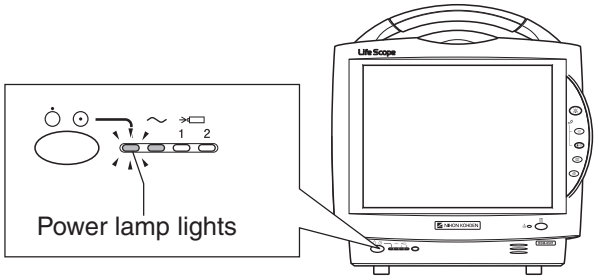
CAUTION

Do not turn the monitor off when the system check screen is displayed. Otherwise the saved data may be damaged or deleted. If the monitor is turned off during system check, delete all data because the data is not reliable.

NOTE

- It takes a few minutes for the LCD screen to reach full brightness.
- The shadow of the previous screen may remain for a few minutes after changing screens.
- There may be some dots on the LCD screen which are always on or always off, but it does not affect monitoring. This is normal for all LCD screens.
- Even though the position of symbol marks for the lamps are different on BSM-6301 and BSM-6501 or BSM-6701, the function and the position of lamps are the same.

Press the [power] switch on the front panel to turn the power on. The power lamp and the AC power lamp light and self check starts. When the check is complete, the home screen appears.



If the power lamp does not light, check the power cord connection.

CAUTION

When the monitor is turned on, check that a single beep sounds and the red, yellow, cyan and green alarm indicator lamps blink once. This shows that the alarm is functioning properly.

When the monitor power is turned on, alarms are suspended while the monitor is waiting for the electrodes and probe to be attached to the patient. The monitoring starts when the connection cord is connected to the socket on the monitor and the electrodes or probe are attached to the patient. The alarm activates when one of the following occurs:

- at least one parameter is measured and a value is displayed (when AUTO is selected for <ALARM ACTIVATION DELAY> on the ALARM window of the SYSTEM SETUP window)
- ECG, SpO_2 or IBP is continuously monitored for the selected time (when 1 min, 2 min or 3 min is selected for <ALARM ACTIVATION DELAY>)
- NIBP is measured (when 1 min, 2 min or 3 min is selected for <ALARM ACTIVATION DELAY>)

When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON and the monitor power is turned on for more than 30 minutes after the turning power off, the stored data in the monitor is deleted. When the monitor is turned on in less than 30 minutes after turning power off, the stored data is not deleted and monitoring continues. When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to OFF, the message appears asking whether monitoring a new patient or not. The factory default setting is ON.

Check After Turning On the Power and During Monitoring

To start monitoring safely and properly, check the following items after turning on the power. If any problem is detected, take the proper countermeasure according to the troubleshooting and maintenance sections.

- There is no fire, smoke or smell.
- The monitor is not too hot.
- The power lamp and other lamps light.
- The red, yellow, cyan and green alarm indicator lamps blink once and a beep sounds.
- The start up screen appears and the home screen appears.
- No error message is displayed on the screen.
- The time on the screen is correct.
- The monitor does not affect surrounding equipment.
- The data and waveforms are displayed properly.
- Keys and switches operate properly.
- The touch keys function properly and the key clicking sound is generated.
- Alarm functions properly.
- Alarm sound can be heard.

- Alarm sound volume setting is appropriate.
- There is no trouble in recording (when using an optional recorder).

NOTE

After turning the monitor on and when admitting a patient on the monitor, make sure that the time displayed at the upper right of the screen is correct. When the date or time is changed during monitoring, the date and time of all stored data is also changed and might not match the date and time on the printout.

When the monitor is connected to a network

The time on this monitor is automatically adjusted to match the time of the network as long as the monitor is connected to the network. The date and time on all monitors in the network are set to the same setting.

Monitor Status on Power Interruption

When there is a power failure or sudden power interruption, the monitor status is as follows.

- When a battery pack is installed in the monitor, the BSM-6301 and BSM-6501 operate for about 90 minutes and the BSM-6701 operates for about 60 minutes on battery power.
- When the monitor has no battery pack installed or the battery pack is discharged, the monitor turns off. When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON, the patient data and settings return to the default settings 30 minutes after the monitor is turned off. When <AUTO ADMIT> is set to OFF, you can select whether to save the settings or initialize the master settings. If the monitor power is turned off and on again within 30 seconds, monitoring continues.

When there is a power failure or sudden power interruption, immediately connect the monitor to the emergency power source. It is recommended to always keep the battery pack in the monitor.

Turning the Power Off

NOTE

Even though the position of symbol marks for the lamps are different on BSM-6301 and BSM-6501 or BSM-6701, the function and the position of lamps are the same.

Press the [power] switch on the front panel for more than 3 seconds to turn the power off. The screen becomes dark and the power lamp on the front panel turns off.

Check After and Before Turning the Power Off

Check the following items for the next use.

- Previous patient data is deleted.
- Temporarily changed settings are changed back to the previous settings.
- There is no dirt, damage or scratches on the monitor.
- The sensors, probes, transducers, and cables are cleaned and sterilized.
- Accessories are cleaned and stored properly.
- There are enough consumables, such as recording paper, and disposable electrodes for the next use.
- Battery pack is fully charged.
- The [power] switch on the monitor is turned off and the power cord is disconnected from the monitor.
- The monitor is not in a wet place.
- Dead batteries are disposed of properly.
- Medical waste is disposed of properly.
- The monitor is stored properly.

Setting the Bar Code Reader

Scanning the Bar Code Reader Settings

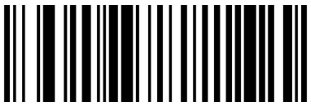
You can use the Symbol LS2208 from Motorola, Inc. Refer to the manual. You can download the manual from http://support.symbol.com on the Motorola website.

Following are the minimum settings of the bar code reader. Scan the following bar codes in order. When scanning the bar code, there is one short high beep. For further settings, refer to the Symbol LS2208 manual.

*: This setting is a default value. You can skip scanning this bar code if you have already used this bar code reader with the default value.

Beeper Volume

Low Volume



USB Device Type

HID Keyboard Emulation*

USB Country Keyboard Types (Country Codes)

North American Standard USB Keyboard*

Transmit Code ID Character

None*

Scan Data Transmission Format

Scan Options

<DATA> <SUFFIX>

Enter

Transmit "No Read" Message

Disable No Read*

Enable/Disable Codabar

Enable Codabar

Initializing the Bar Code Reader

Scanning this bar code returns all data to the default values. Scan the following bar code if you want to initialize the bar code reader.

Set All Defaults

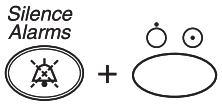
Checking the Bar Code Reader Operation

Scan the bar code of the patient on the home screen (for BSM-6000A series only) or the PATIENT ID window of the PATIENT INFO page in the ADMIT window and check the patient ID is entered on the PATIENT ID window of the PATIENT INFO page in the ADMIT window.

Calibrating the Touch Screen

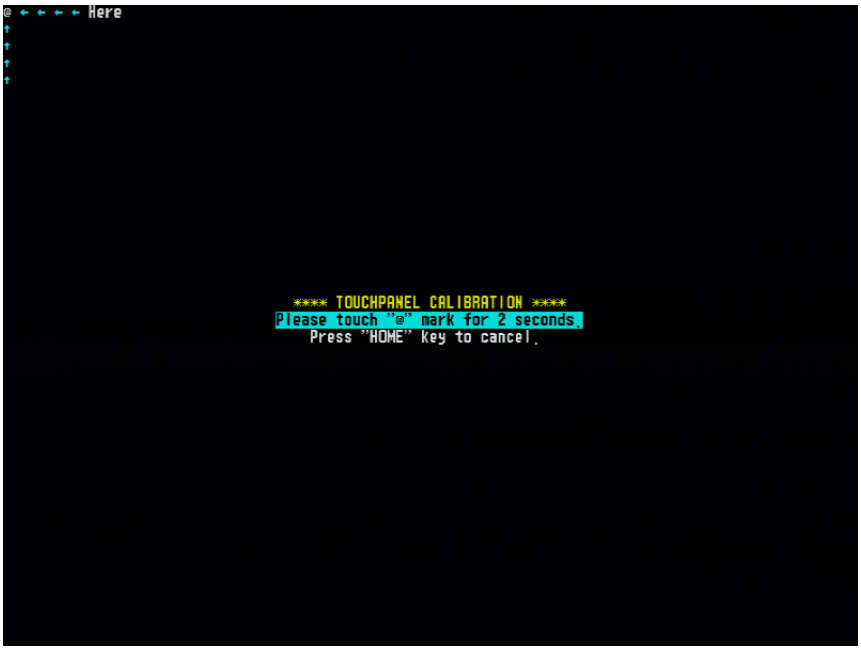
Calibrate the touch screen when the pressed position and the activated position do not match.

1. Turn the monitor power off.



2. Press the [power] switch while pressing the [Silence Alarms] key on the front panel until the DIAGNOSTIC CHECK screen is displayed.

3. Press the [Menu] key. The TOUCHPANEL CALIBRATION screen appears.



4. Touch the @ mark at the upper left corner of the screen for 2 seconds. When the mark is correctly touched, another mark appears in the lower right corner of the screen. Touch the mark for 2 seconds.

   When the marks are touched correctly, the “TOUCHPANEL CALIBRATION SUCCEEDED” message appears, then the DIAGNOSTIC CHECK screen appears.

5. Touch the RETURN key to display the home screen.

Using ECG/BP Output as the Synchronous Signal

The ECG, IBP and heart rate pulse trigger output signal from the monitor can be used as the synchronizing signal on a medical electrical instrument, such as IABP equipment or defibrillator, which complies with IEC 60601-1.

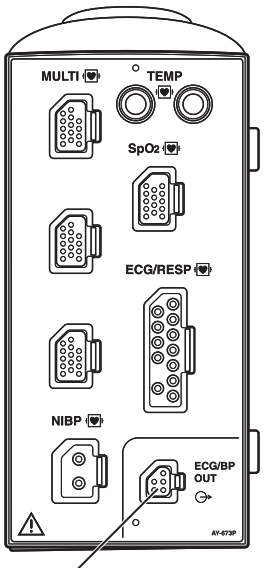
CAUTION

When using the output signal from the monitor as the synchronization signal for other equipment such as an IABP (intra-aortic balloon pump) or defibrillator:

- Set the timing of the IABP by checking the waveform on the IABP screen.
- Check the condition of the bedside monitor at all times. The output signal may become unstable.
- Check that the delay time of the output signal is within the range of the connected equipment.

CAUTION

Only a Nihon Kohden defibrillator can use the output signal from the monitor as a synchronization signal. Check that the delay time of the output signal (heart rate trigger 20 ms maximum) is within the range of the connected defibrillator.



ECG/BP OUT socket
Outputs 1 V/1 mV ECG, 1 V/100 mmHg BP and open collector heart rate trigger signals

NOTE

- When using an IBP waveform as a synchronization signal for other equipment, connect the IBP line to the MULTI socket on the input unit. The IBP waveform that is used for the synchronization signal depends on the “IBP ANALOG OUT” setting in the SYSTEM SETUP window.
  - When “IBP ANALOG OUT” is set to “FIXED POSITION”: The IBP line connected to the top MULTI socket on the input unit is used.
  - When “IBP ANALOG OUT” is set to “HIGHEST PRIORITY LABEL” : When more than one IBP waveform is acquired, the IBP waveform of the highest priority label is used.
    IBP label priority:
    ART > ART2 > RAD > DORS > AO > FEM > UA > LVP > P1 > P2 > P3 > P4 > P5 > P6 > P7
- The output signal from the ECG/BP OUT socket may become unstable in the following conditions.
  - Electrode is dry or detached.
  - Electrode lead is damaged or disconnected from the electrode.
  - Electrode lead is pulled.
  - AC interference or EMG noise superimposed.
  - Air bubbles or blood clog in the circuit for monitoring IBP.
  - Cord or cable is disconnected or damaged.
- All instruments which are to be connected to the ECG/BP OUTPUT socket must use a YJ-910P or YJ-920P ECG/BP output cable and comply with the IEC 60601-1 safety standard for medical equipment.
- When using an IABP, set <CALCULATION METHOD> on the OTHER page of the PRESS window to “PEAK” to improve measurement accuracy.
- The AY-660P input unit has no ECG/BP OUT socket and no signal can be output.

Connect the YJ-910P or YJ-920P ECG/BP output cable to the ECG/BP OUT socket on the input unit and the external instrument.

The following shows the delay time of the output signal.

Output Signal	Delay Time
ECG	20 ms
BP	40 ms
Heart rate trigger	20 ms

Section 2 Changing SYSTEM CONFIGURATION Screen Settings

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Setting Items on the SYSTEM CONFIGURATION Screen 2.2
Displaying the SYSTEM CONFIGURATION Screen 2.3
Closing the SYSTEM CONFIGURATION Screen 2.5
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UNITS Window 2.8
TRANSPORT Window 2.9
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Overview

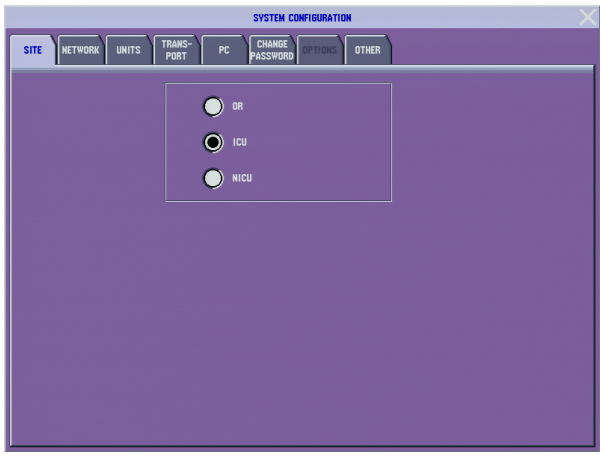
The section explains how to change settings on the SYSTEM CONFIGURATION screen.

The initial settings on the SYSTE M CONFIGURATION screen must be changed before monitoring. Changing these settings during monitoring interrupts monitoring. All other settings can be changed any time without interrupting monitoring. You can check the contents of the SYSTEM CONFIGURATION screen settings on the CONFIGURATION page of the SYSTEM SETUP window so that the monitor power does not need to be turned off and monitoring is not interrupted (refer to Section 3).

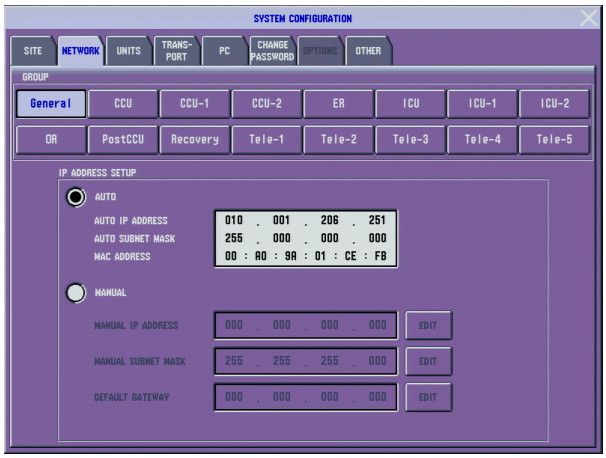
This section also explains how to initialize the monitor. This procedure returns all settings to the factory default settings and deletes all stored data in memory.

Setting Items on the SYSTEM CONFIGURATION Screen

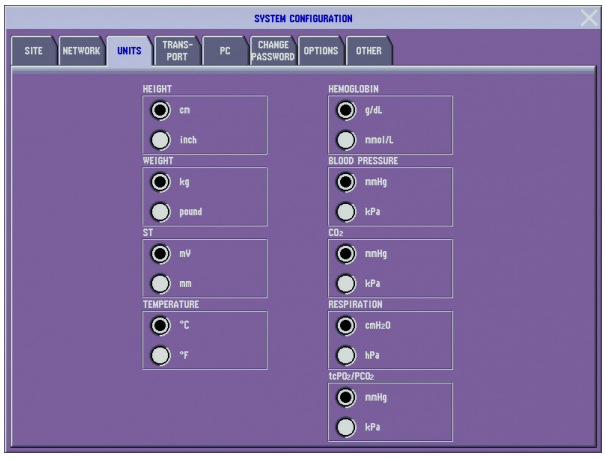
SITE window



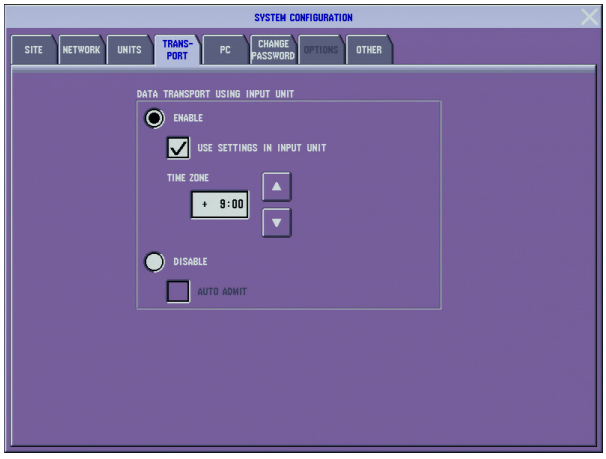
NETWORK window



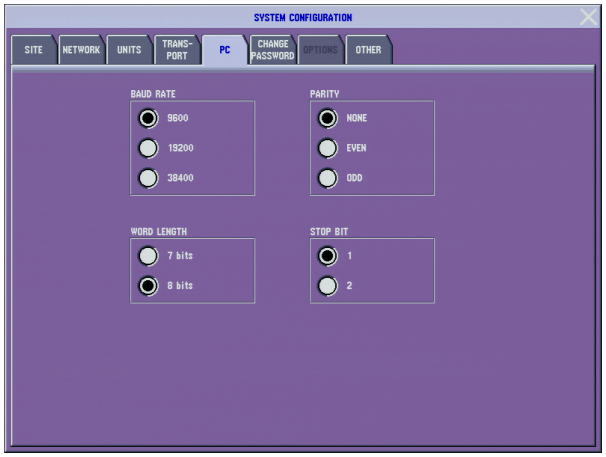
UNITS window



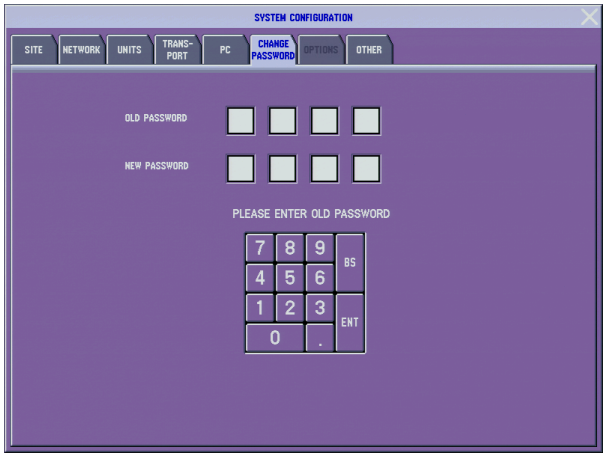
TRANSPORT window



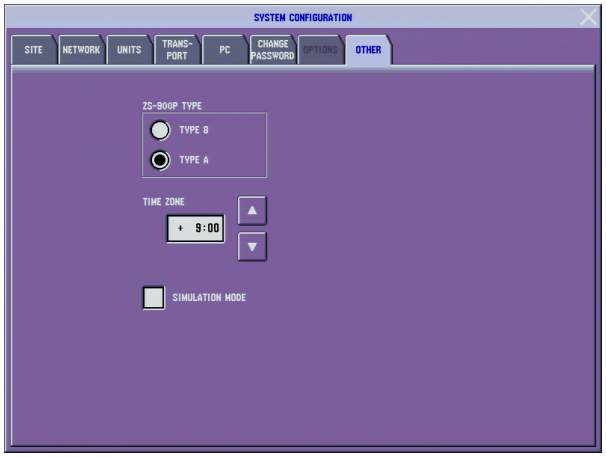
PC window



CHANGE PASSWORD window



OTHER window

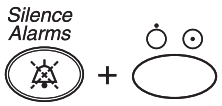


Displaying the SYSTEM CONFIGURATION Screen

CAUTION

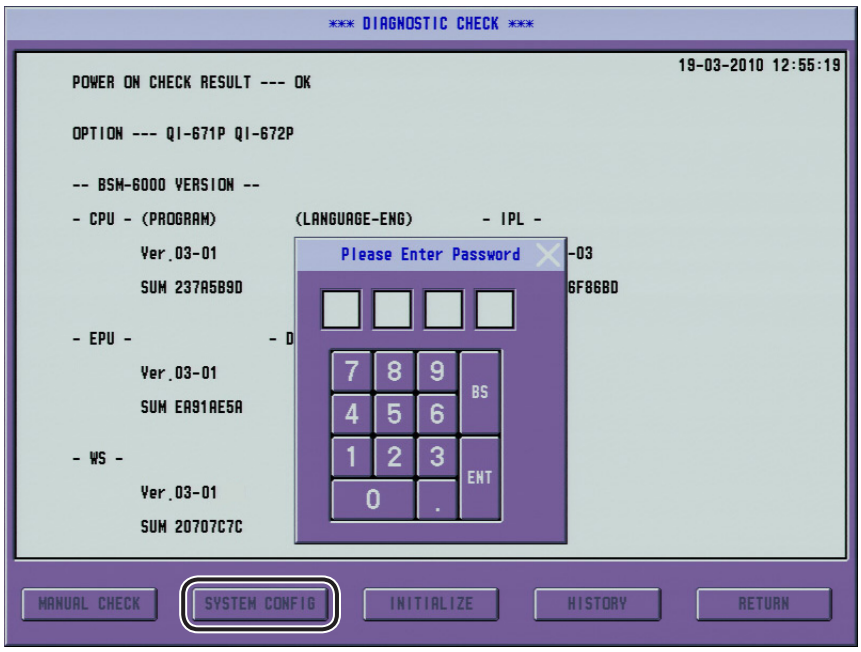
This procedure interrupts all monitoring. Only change these settings before or after monitoring.

1. Turn the monitor power off.



2. Press the [power] switch while pressing the [Silence Alarms] key on the front panel until the DIAGNOSTIC CHECK screen is displayed.

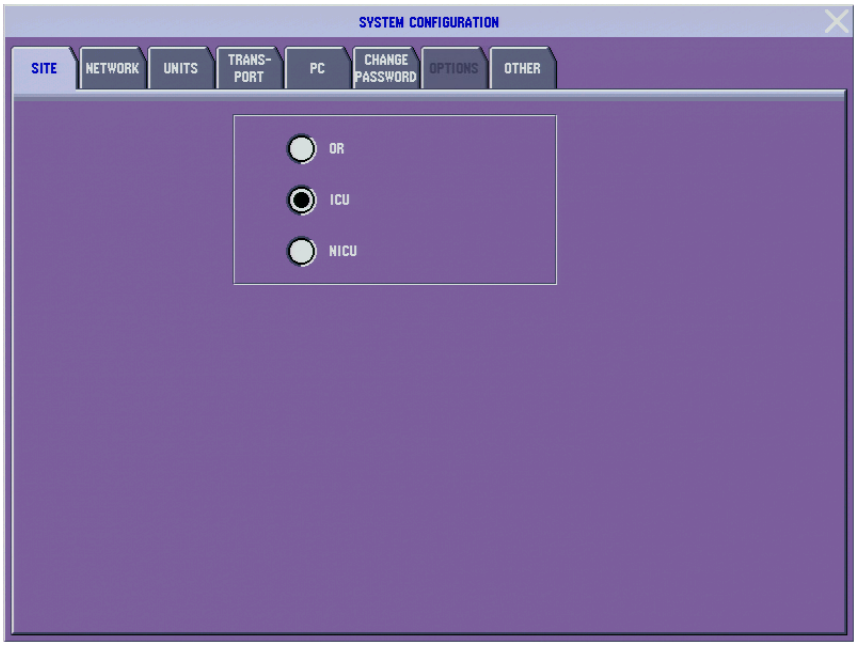
3. Touch the SYSTEM CONFIG key. The dialog box to enter the password appears.



4. Enter the password with the number keys and touch the ENT key. The SYSTEM CONFIGURATION screen appears.

   The default password is “1234”.

5. Touch the desired tab to display the desired window.



6. Change any necessary settings.

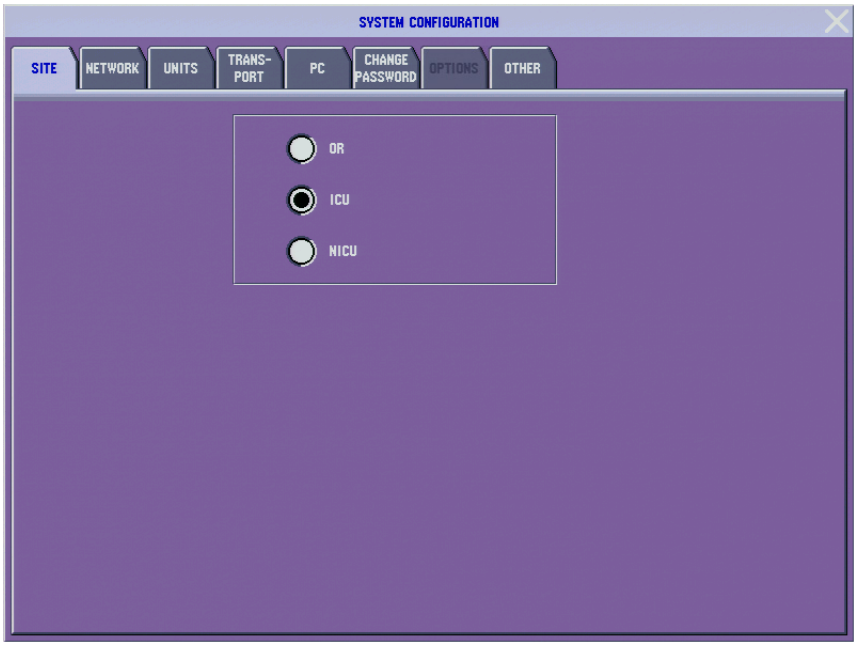
Closing the SYSTEM CONFIGURATION Screen

1. Touch the close button (☒) on the SYSTEM CONFIGURATION screen to return to the DIAGNOSTIC CHECK screen.

2. Touch the RETURN key. The home screen appears.

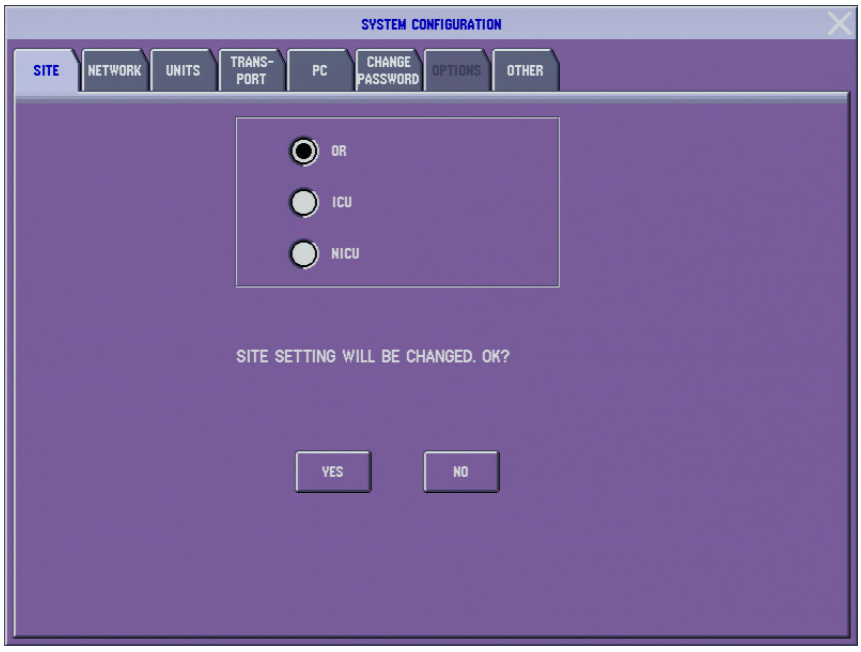
SITE Window

Select the site according to the operating environment. The default settings, including alarm upper and lower limit settings, differ according to site.



OR: Sleep mode is not available. SIM mode for NIBP is available.
ICU: Sleep mode is available. SIM mode for NIBP is not available.
NICU: Sleep mode is available. SIM mode for NIBP and 12 lead analysis is not available.

To change the site, select the new site. The “SITE SETTING WILL BE CHANGED. OK?” message appears. Touch the YES key to change the site.



When the site is changed, the settings change to the factory default settings according to the new site. The factory default settings of the SYSTEM CONFIGURATION screen and SYSTEM SETUP window are listed in the “Factory Default Settings” in Section 4 of this manual. Other default settings are listed in the Operator’s Manual.

NETWORK Window

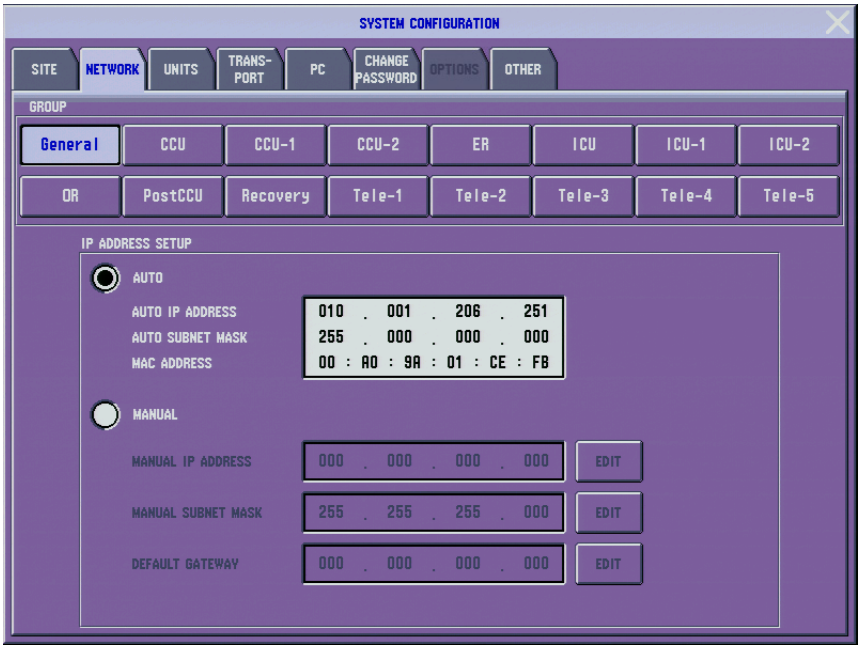
Set the network settings when the bedside monitor is connected to a central monitor network.

CAUTION

The network must be managed by the network administrator. Make sure that each monitor in the network has a different IP address. Otherwise, data communication cannot be performed properly. When adding a monitor to an already operating network, set the IP address on the monitor before connecting the monitor to the network.

CAUTION

When the monitor is connected to a central monitor network, set the Bed Name (Bed ID) and Group Name on the monitor. Otherwise, the default settings are used for the bed name and group name and the bed may be incorrectly identified on the central monitor.



GROUP

Assign a group name for the bedside monitor. When the monitor has acquired the information of the network to which it is connected, the group names assigned by the central monitor appear. Select the group name from this list for the bedside monitor. For details, refer to the central monitor operator's manual.

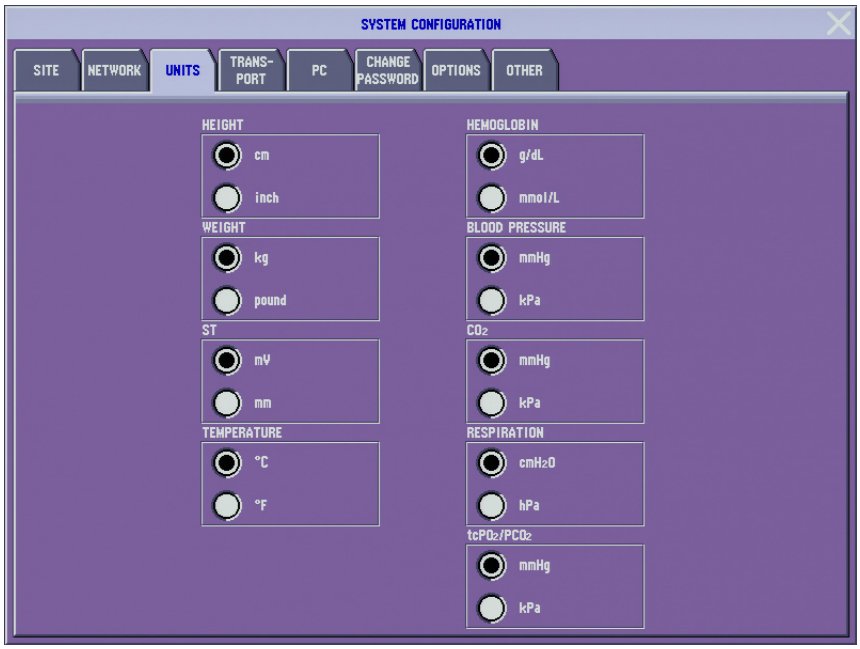
IP ADDRESS SETUP: AUTO, MANUAL

When set to AUTO, the IP address and subnet mask are set automatically.

When set to MANUAL, touch the EDIT key to set the IP address, subnet mask and default gateway.

UNITS Window

Select the unit for each parameter.



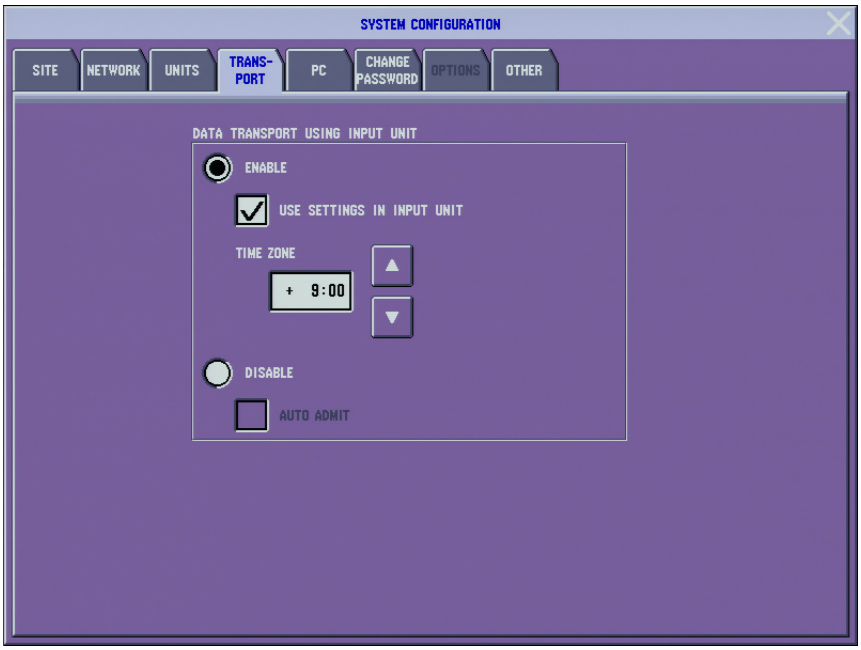
WARNING

ST, CO_2, RESPIRATION, $tcPO_2$/$tcPCO_2$ and HEMOGLOBIN settings only affect the individual bedside monitor, not on all monitors connected to the network. The unit settings must be the same on all bedside monitors and central monitors in the network. Otherwise, the different measurement values and alarms will be displayed on different monitors depending on the unit settings on each monitor.

NOTE

The CO_2 and respiration unit settings are not available on the BSM-6000A series.

TRANSPORT Window



DATA TRANSPORT USING INPUT UNIT: ENABLE, DISABLE

Select whether to enable the transport function. When the transport function is enabled, the patient information and review data can be sent to another bed by disconnecting the input unit from one monitor and connecting it into another monitor.

NOTE

To use the transport function, set the <DATA TRANSPORT USING INPUT UNIT> setting on the TRANSPORT window of the SYSTEM CONFIGURATION screen on both the original monitor and the destination monitor to ENABLE.

ENABLE: Enable the transport function of the monitor.
DISABLE: Disable the transport function of the monitor.

USE SETTINGS IN INPUT UNIT: On, Off

On: Patient information, pacing detection On/Off, QRS detection type, arrhythmia analysis On/Off, vital sign upper/lower alarm limits settings, arrhythmia alarms settings, arrhythmia recall settings, parameters to be saved for full disclosure and ECG lead settings of TRACE 1 and TRACE 2 are sent to destination monitor.

Off: Patient information, pacing detection On/Off and QRS detection type are sent to destination monitor.

TIME ZONE: 0 to ±12:00

CAUTION

When installing the monitor, change the time zone setting to the same setting as the other bedside monitors and central monitors. If the time zone setting is not the same, the data which was in the input unit before transport is deleted when using the transport function with the input unit.

Set the time zone in respect to GMT (Greenwich Mean Time). The time difference can be selected in 30 minute steps.

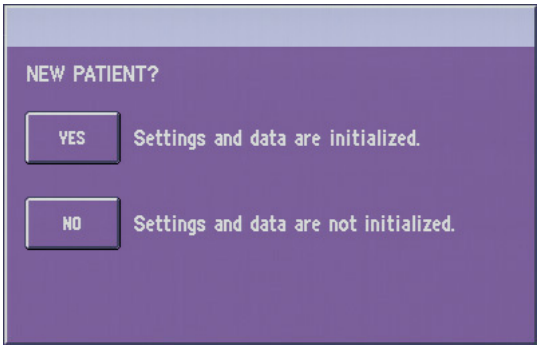
This setting must be the same on all monitors in the same network. Otherwise data communication problems may occur.

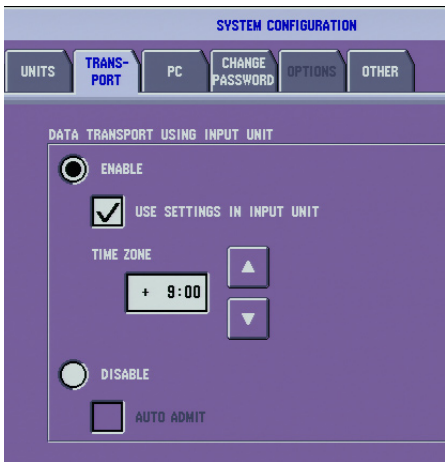
You can also change the time zone setting on the OTHER window of the SYSTEM CONFIGURATION screen.

AUTO ADMIT: On, Off

On: When the monitor power is off for 30 minutes or more, the previous patient and monitoring data is deleted. If the monitor power is off for less than 30 minutes, the patient and monitoring data is not deleted and monitoring continues.

Off: The previous patient and monitoring data is not deleted when the monitor is turned off. The “NEW PATIENT?” dialog box appears when the power is turned on. When the “YES” key is touched, the previous patient and monitoring data is deleted. When the “NO” key is touched, the patient and monitoring data is not deleted and monitoring continues.



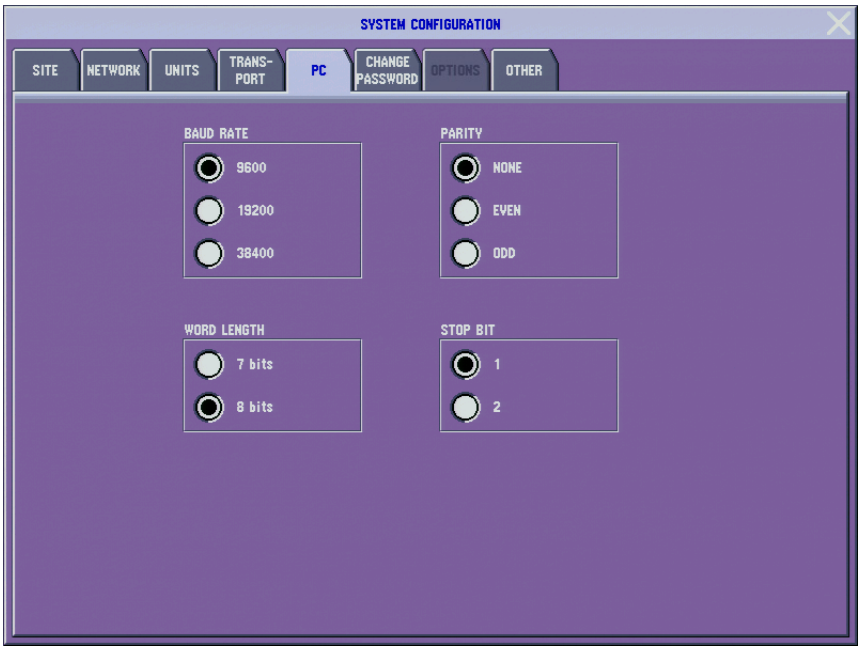


NOTE

When <DATA TRANSPORT USING INPUT UNIT> on the TRANSPORT window of the SYSTEM CONFIGURATION screen is set to ENABLE, AUTO ADMIT is fixed to OFF.

PC Window

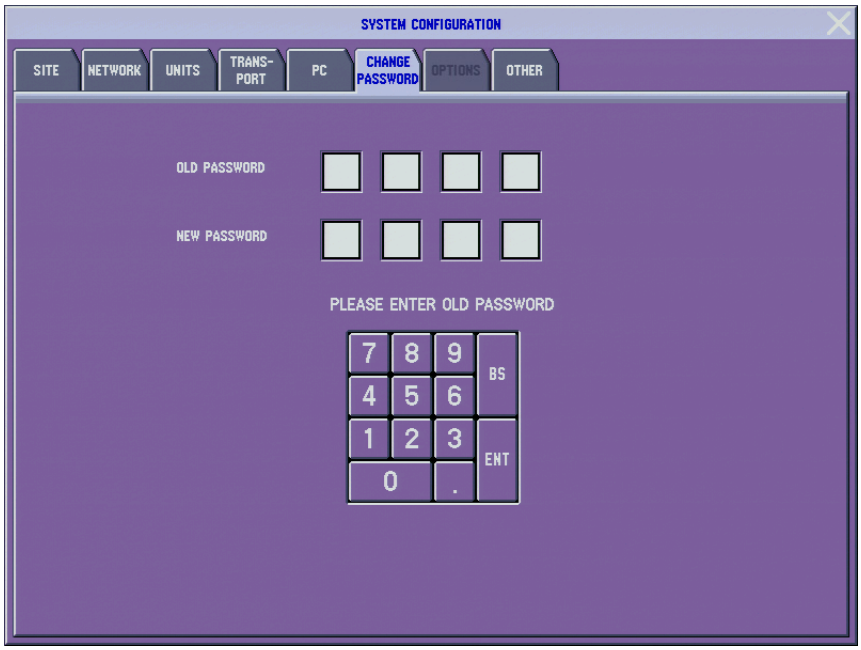
Change settings according to the PC connected to the bedside monitor.



CHANGE PASSWORD Window

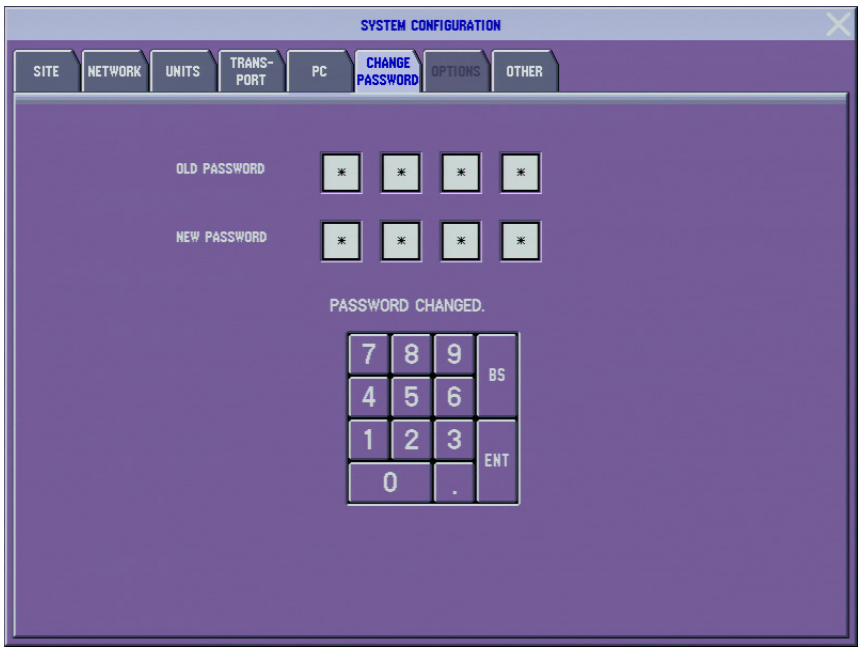
Set the 4-digit password required for displaying the SYSTEM SETUP window.

1. Enter the current password in the <OLD PASSWORD> box using the number keys on the screen. The default password is “1234”.



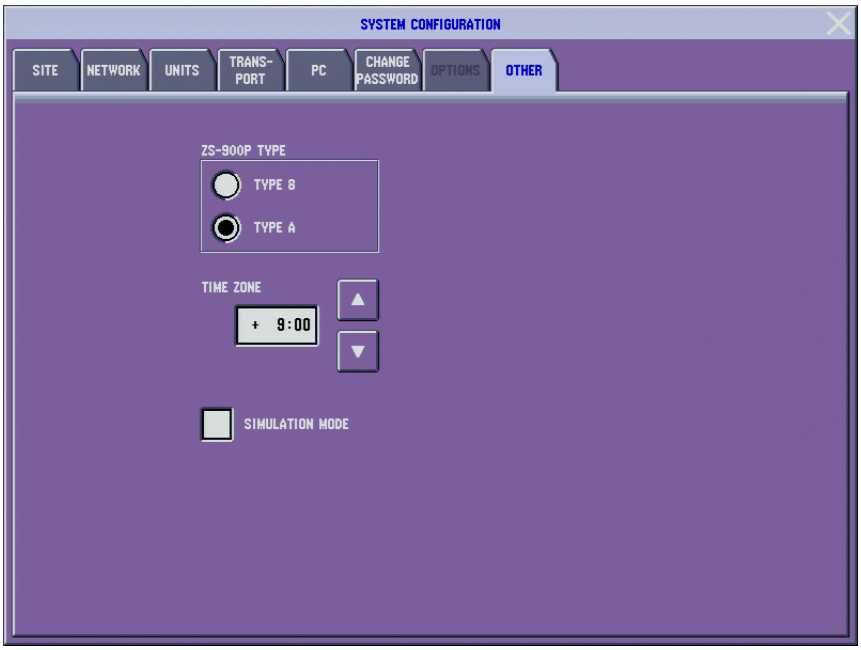
2. Touch the ENT key. The “PLEASE ENTER NEW PASSWORD” message appears.

3. Enter the new password in the <NEW PASSWORD> box using the number keys on the screen.



4. Touch the ENT key to register the new password.

OTHER Window



ZS-900P TYPE: TYPE 8, TYPE A

Select the parameter group for transmitting data by the ZS-900P transmitter. CO_2 data cannot be received by a monitor on which CO_2 is not available.

TYPE 8: ECG, SpO_2, NIBP, IBP connected to MULTI socket 1 or 2, temperature connected to the TEMP sockets and respiration (thermistor) connected to MULTI socket 1 or 2

TYPE A: ECG, SpO_2, NIBP, IBP connected to MULTI socket 1 or 2, temperature connected to the TEMP sockets and CO_2 or respiration (thermistor) connected to MULTI socket 1 or 2

ZS-900P transmitter is not available for BSM-6000A series.

TIME ZONE: 0 to ±12:00

Set the time zone in respect to GMT (Greenwich Mean Time). The time difference can be selected in 30 minute steps.

This setting must be the same on all monitors in the same network. Otherwise data communication problems may occur.

SIMULATION MODE

When this item is checked, it enters SIMULATION MODE and when it returns to the home screen, simulated waveforms and numeric value appear on the screen. These can be used for demonstration of the monitor.

When the power is turned off after SIMULATION MODE is checked, SIMULATION MODE is turned off.

For normal monitoring, uncheck this item.

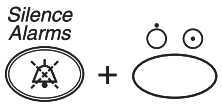
Initializing the Monitor

Use the following procedure to initialize the monitor. Initializing the monitor sets all settings to the factory default settings for ICU mode. The factory default settings of the SYSTEM CONFIGURATION screen and SYSTEM SETUP window are listed in the “Factory Default Settings” in Section 4 of this manual. Other default settings are listed in the Operator’s Manual.

CAUTION

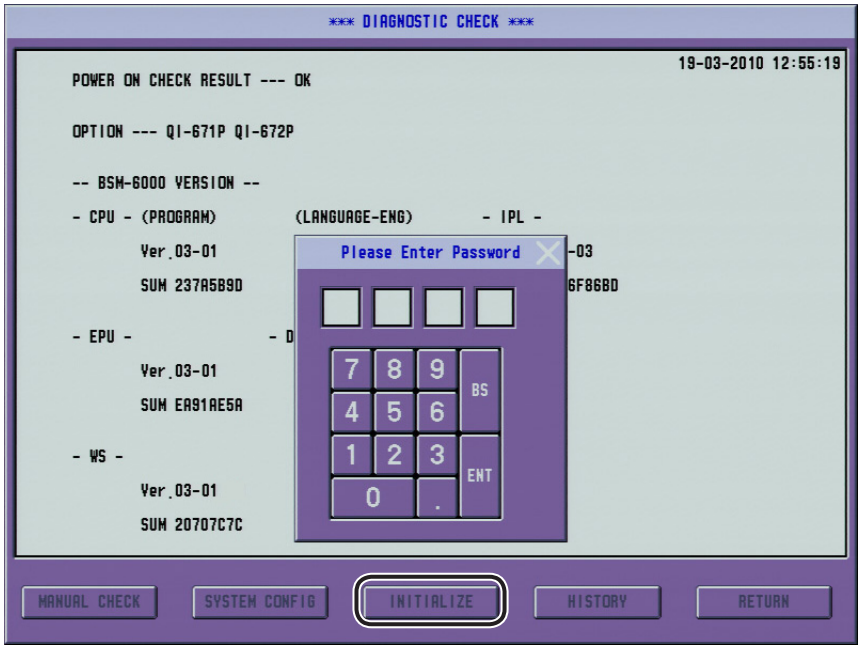
All patient data and stored data are deleted and all settings return to the factory default settings.

1. If the monitor power is on, turn it off.



2. Press the [power] switch while pressing the [Silence Alarms] key on the front panel until the DIAGNOSTIC CHECK screen is displayed.

3. Touch the INITIALIZE key. The dialog box to enter the password appears.

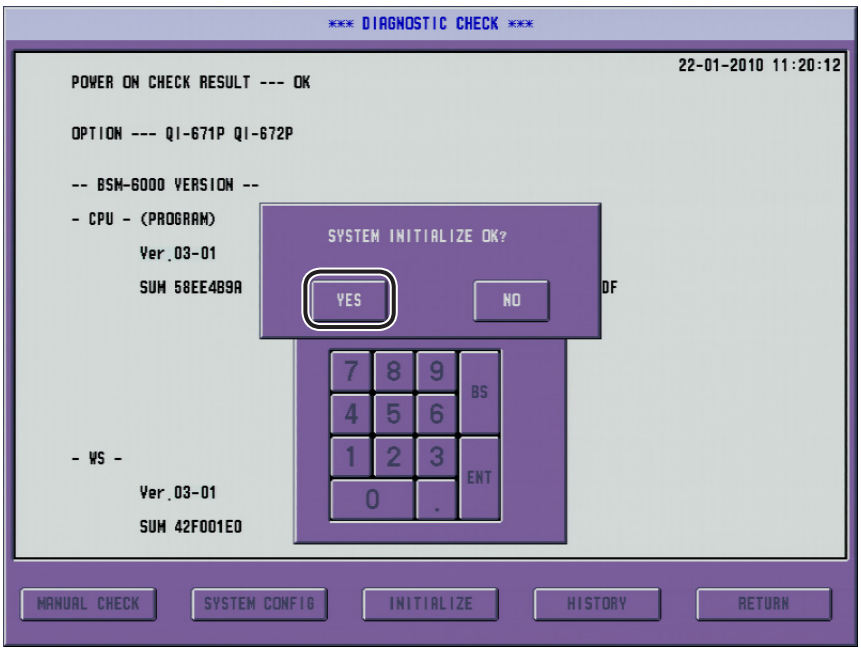


4. Enter the password with the number keys and touch the ENT key. The confirmation dialog box appears.

   The default password is “1234”.

5. Touch the YES key to initialize the monitor.

   Touch the NO key to cancel initializing.



When initializing is finished, the “SYSTEM INITIALIZED” message appears.

6. Touch the RETURN key on the DIAGNOSTIC CHECK screen to display the home screen.

Section 3 Changing SYSTEM SETUP Window Settings

Overview 3.3
- Setting Items on the SYSTEM SETUP Window 3.3
- Displaying the SYSTEM SETUP Window 3.8
- Closing the SYSTEM SETUP Window 3.9
- The INFO Page of the INFO Window 3.10
- The CONFIGURATION Page of the INFO Window 3.10
- The MAINTENANCE Page of the INFO Window 3.11
  - BATTERY Tab 3.11
  - LOAD/SAVE SETTINGS Tab 3.11

SYSTEM Window 3.12
- DISPLAY Page 3.12
- LAYOUT Page 3.13
- VOLUME Page 3.15

BED ID Window 3.17

PARAMETERS Window 3.18
- ECG Page 3.18
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  - SIM Tab 3.21
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  - VENOUS PUNCTURE Tab 3.23
  - INITIAL CUFF PRESS Tab 3.23
- CO_2 Page 3.24
- GAS Page 3.24
  - MAINTENANCE Tab 3.24
  - SETTINGS Tab 3.25
  - INFO Tab 3.26
- FLOW/Paw Page 3.26
  - CAL Tab 3.26
  - SETTINGS Tab 3.27
  - MAINTENANCE Tab 3.27
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- OTHER PARAM Page 3.29

ALARM Window 3.31
- SILENCE/SUSPEND Page 3.31
- DISPLAY/SOUND Page 3.33
- ALARM PRIORITY Page 3.34
- ARRHYTH PRIORITY Page 3.35
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- SLEEP Page 3.37

COLOR Window 3.38

RECORD Window 3.40
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PRINTER Page 3.41
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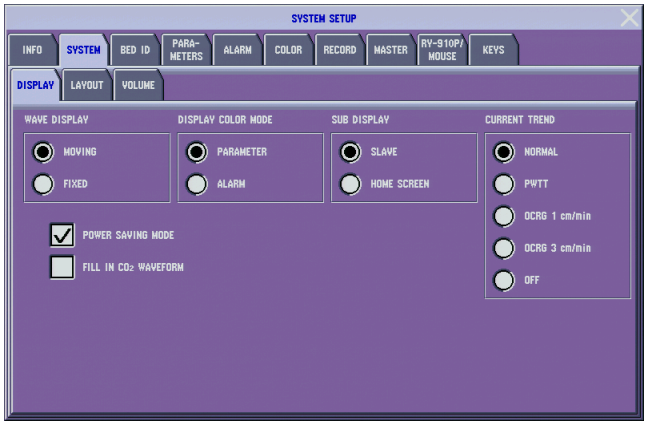
ARRHYTH Page 3.46
RY-910P/MOUSE Window 3.48
KEYS Window 3.49

Overview

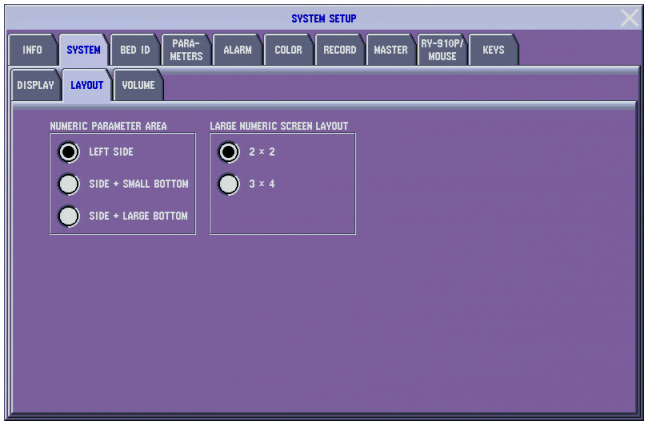
This section explains how to change settings on the SYSTEM SETUP window. The SYSTEM SETUP window can only be entered by an administrator who has the password to access these windows. Changing the settings on the SYSTEM SETUP window does not interrupt monitoring, but it is recommended to check and change them before monitoring a patient because these settings involve basic measurement conditions.

Setting Items on the SYSTEM SETUP Window

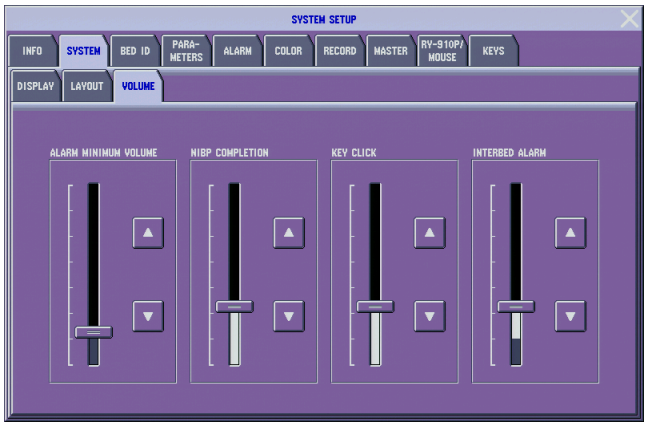
SYSTEM - DISPLAY page



SYSTEM - LAYOUT page

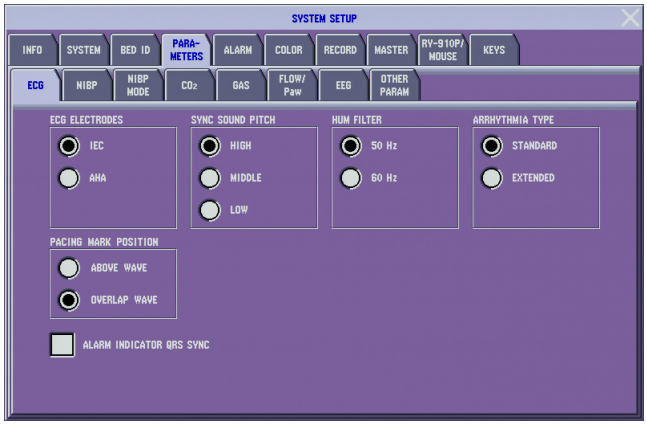


SYSTEM - VOLUME page

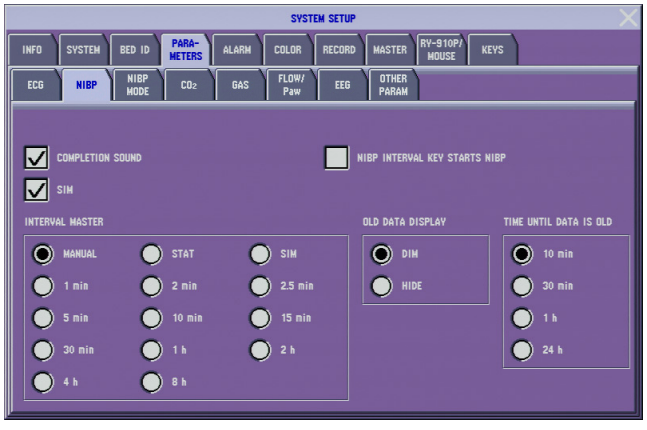


BED ID window

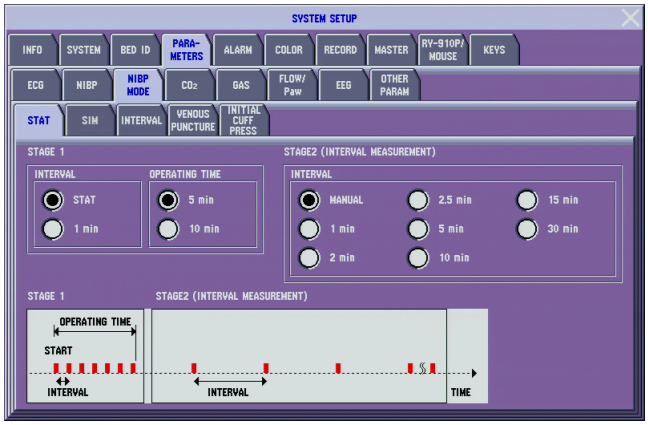
PARAMETERS - ECG page



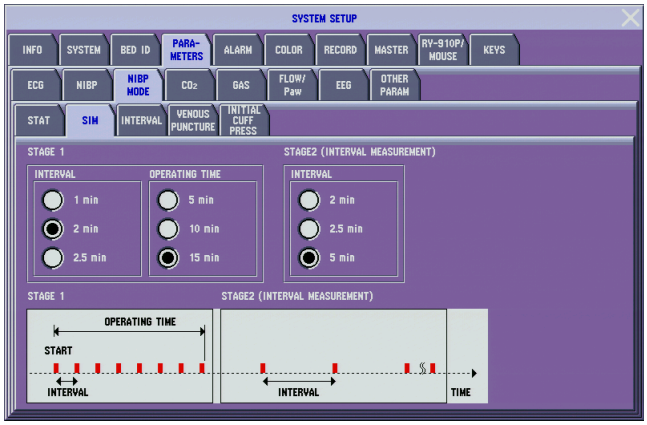
PARAMETERS - NIBP page



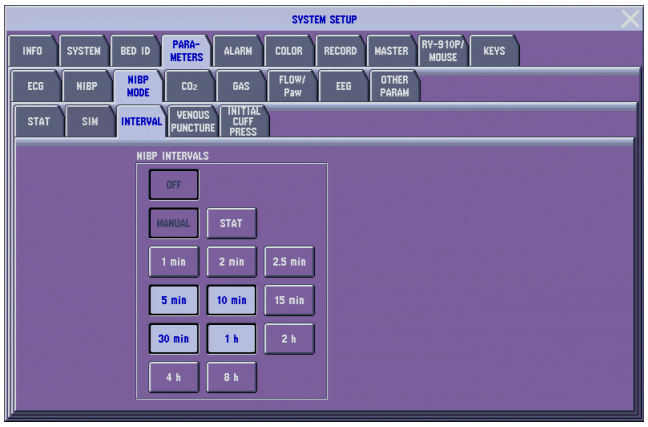
PARAMETERS - NIBP MODE - STAT tab



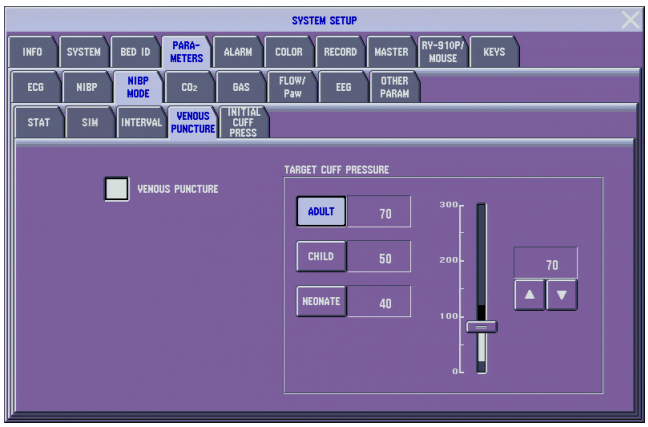
PARAMETERS - NIBP MODE - SIM tab (OR site only)



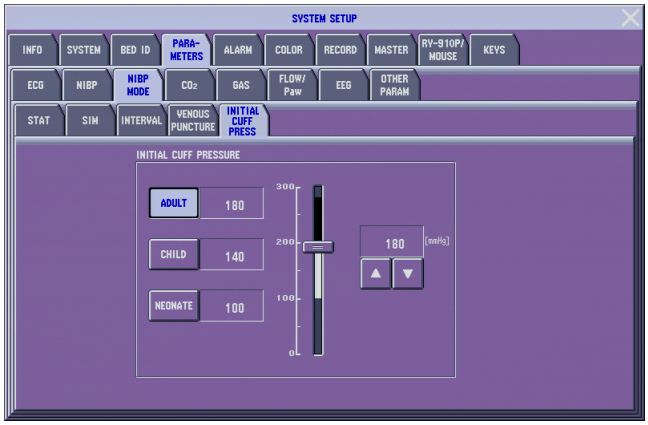
PARAMETERS - NIBP MODE - INTERVAL tab



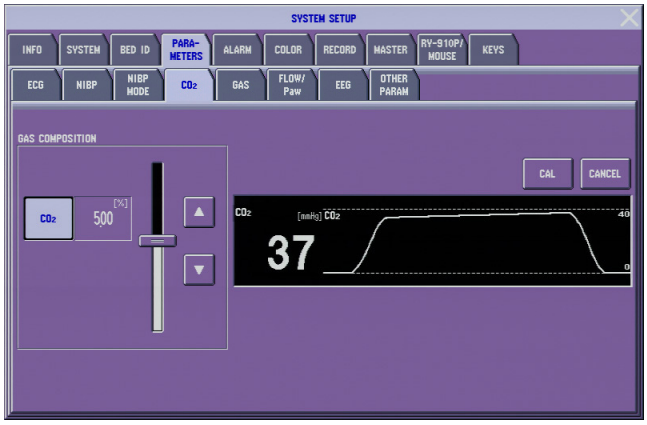
PARAMETERS - NIBP MODE - VENOUS PUNCTURE tab



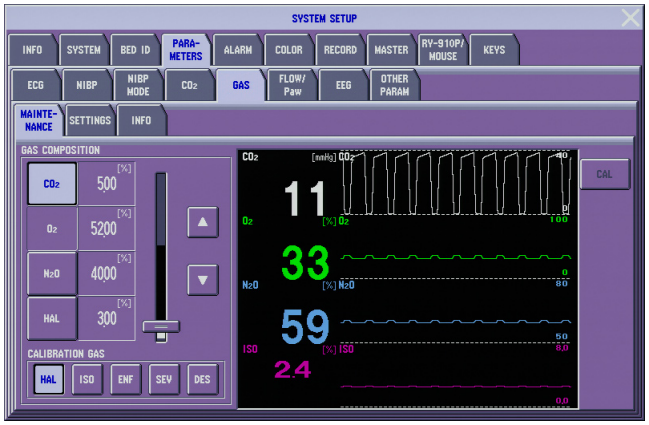
PARAMETERS - NIBP MODE - INITIAL CUFF PRESS tab



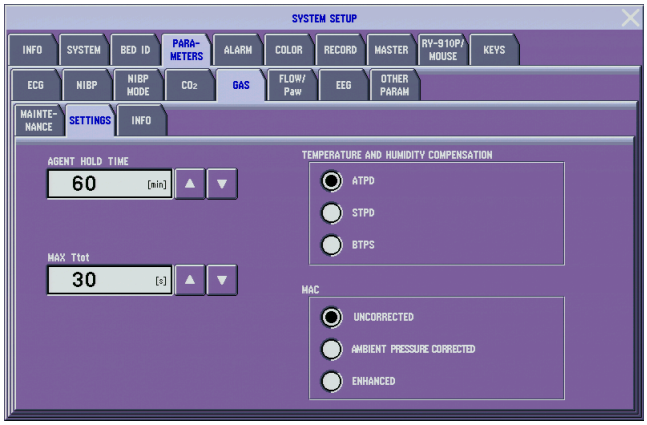
PARAMETERS - CO_2 page



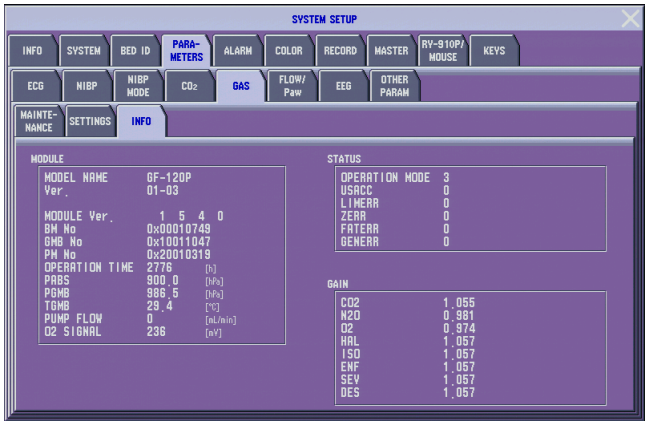
PARAMETERS - GAS - MAINTENANCE tab



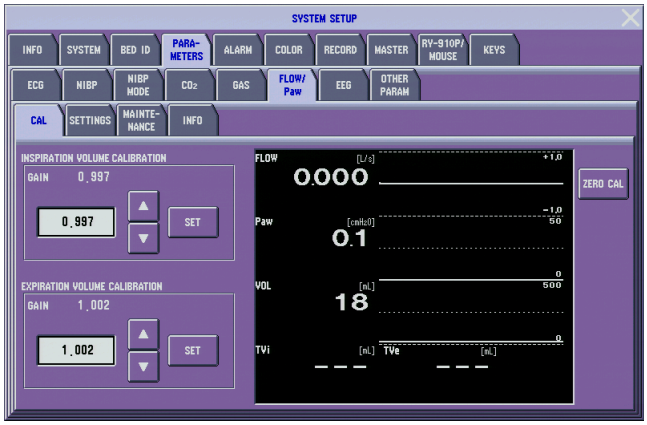
PARAMETERS - GAS - SETTINGS tab



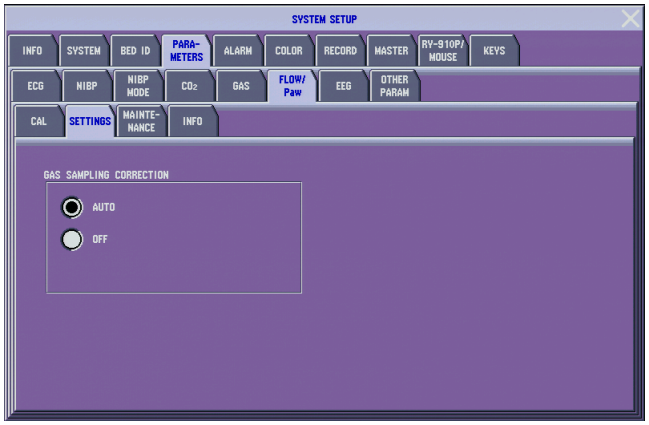
PARAMETERS - GAS - INFO tab



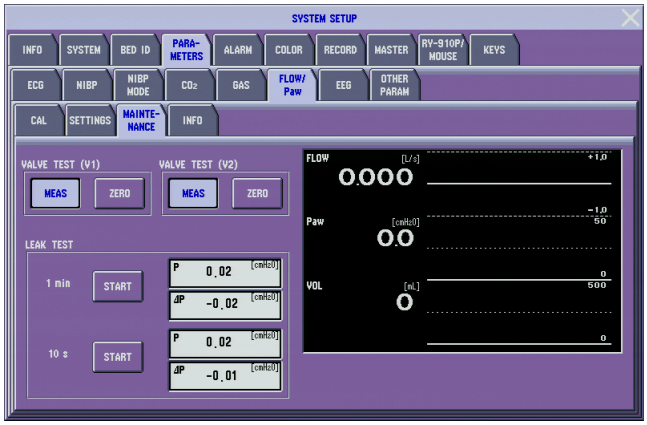
PARAMETERS - FLOW/Paw - CAL tab*



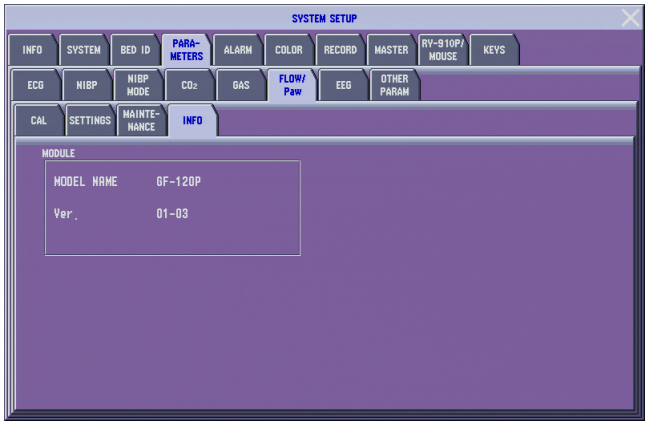
PARAMETERS - FLOW/Paw - SETTINGS tab*



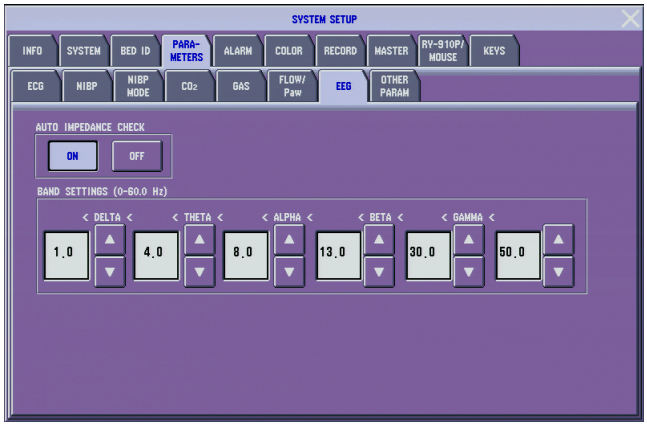
PARAMETERS - FLOW/Paw - MAINTENANCE tab*



PARAMETERS - FLOW/Paw - INFO tab*



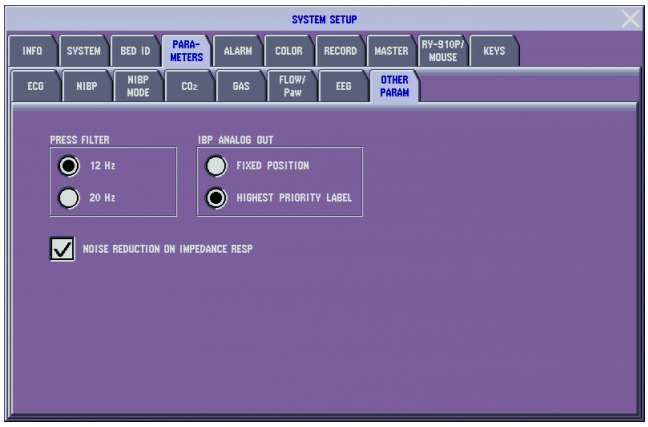
PARAMETERS - EEG page



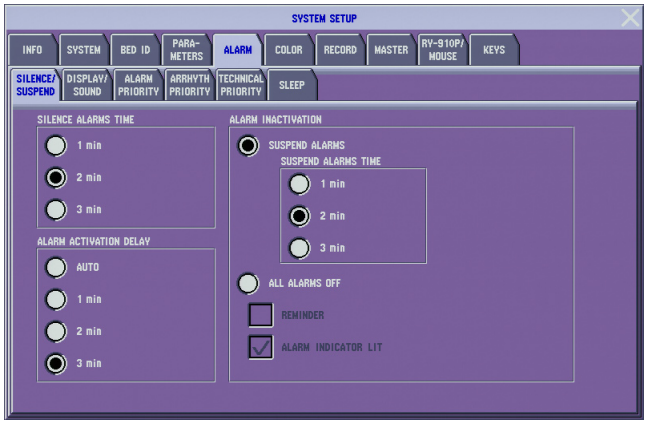
* FLOW/Paw is not available for BSM-6000A series.

* EEG is not available for BSM-6000A series.

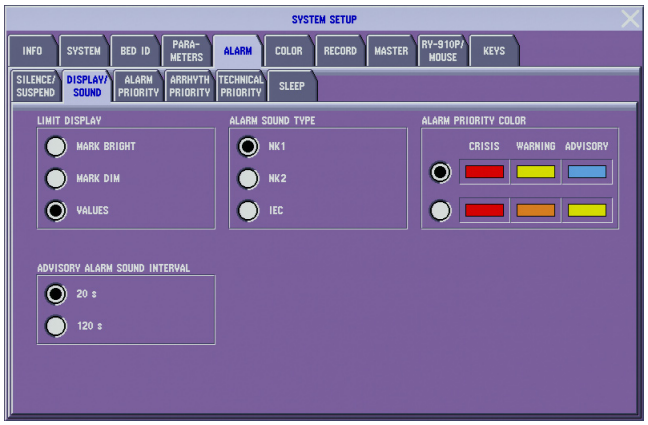
PARAMETERS - OTHER PARAM page



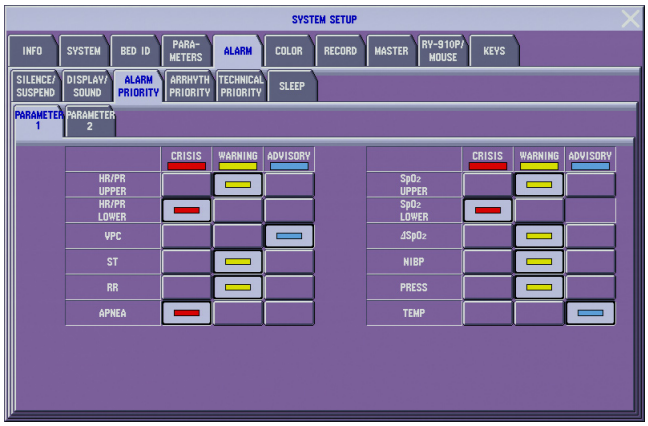
ALARM - SILENCE/SUSPEND page



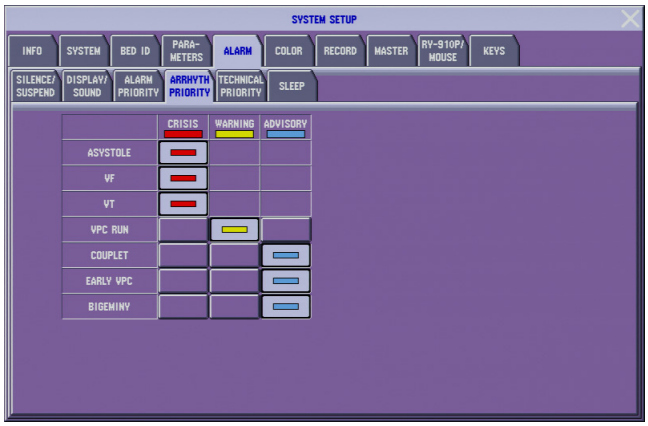
ALARM - DISPLAY/SOUND page



ALARM - ALARM PRIORITY page

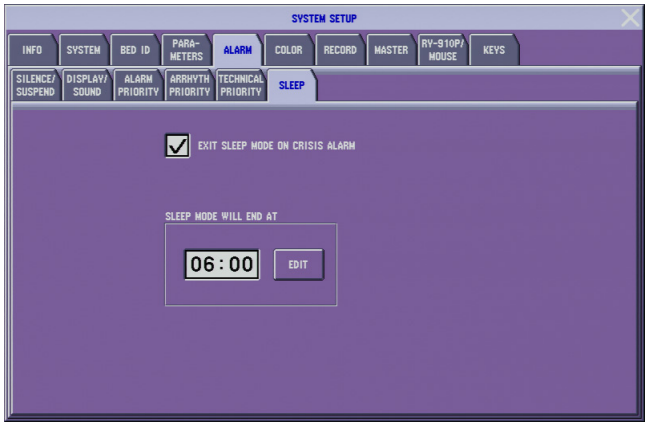


ALARM - ARRHYTH PRIORITY page



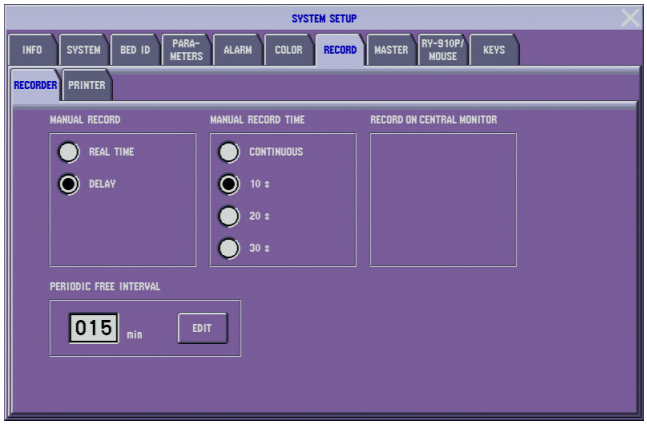
ALARM - TECHNICAL PRIORITY page

ALARM - SLEEP page

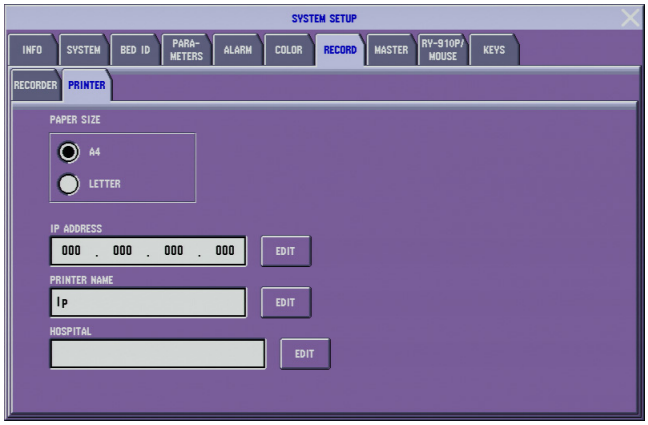


COLOR window

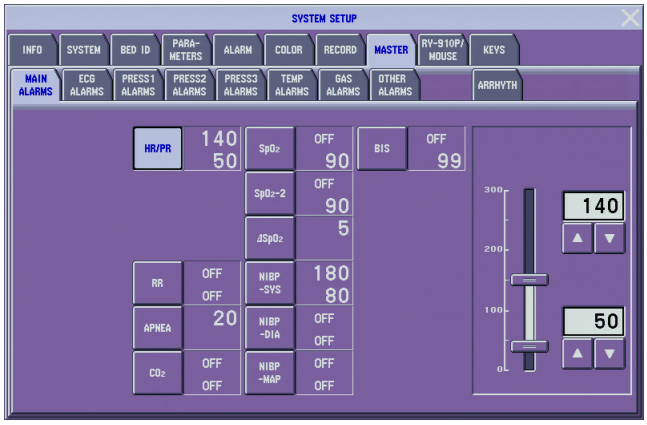
RECORD - RECORDER page



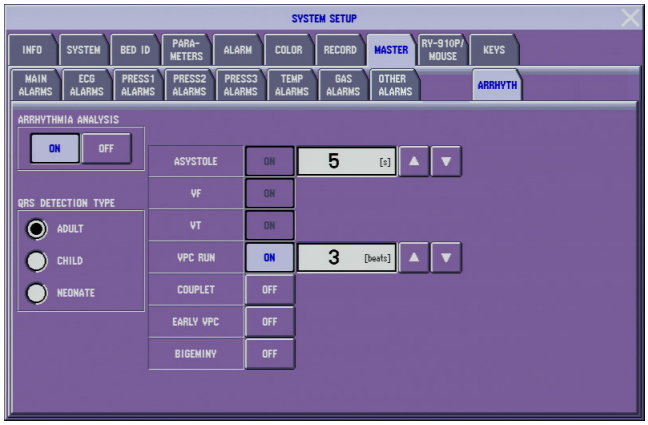
RECORD - PRINTER page



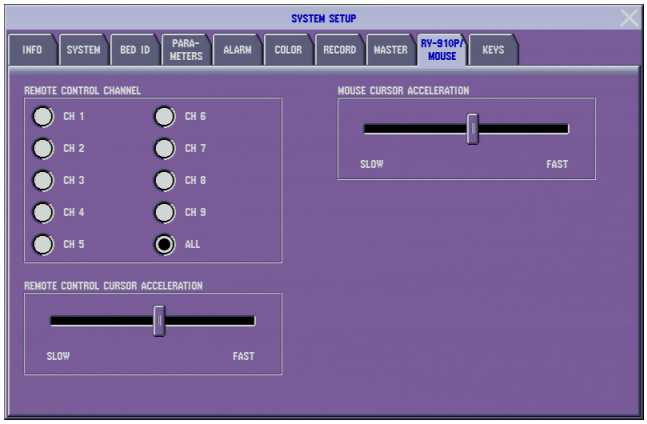
MASTER - MAIN ALARMS page



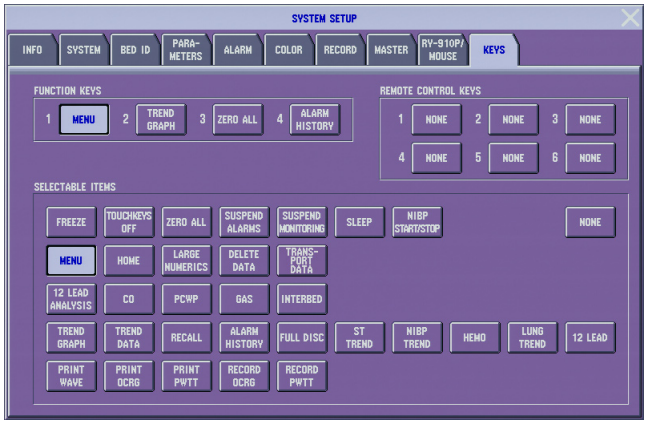
MASTER - ARRHYTH page



RY-910P/MOUSE window



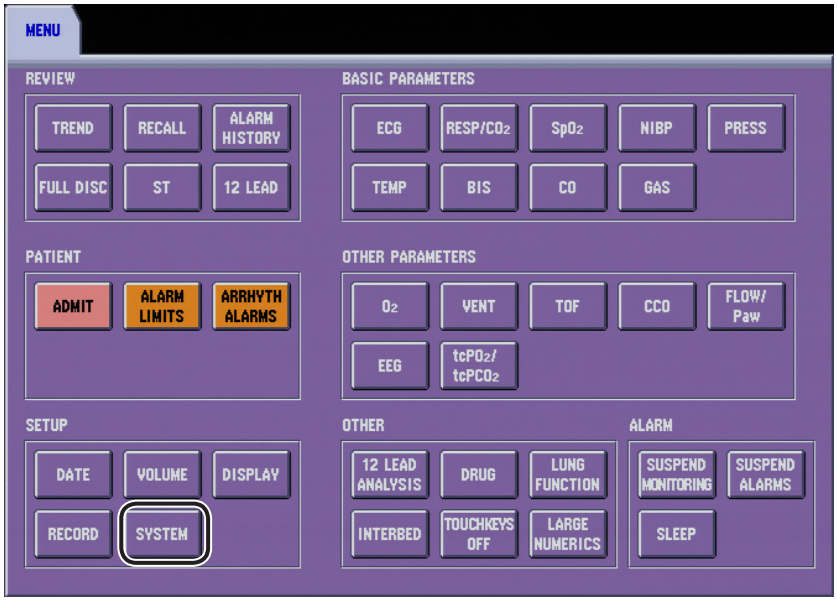
KEYS window



Displaying the SYSTEM SETUP Window

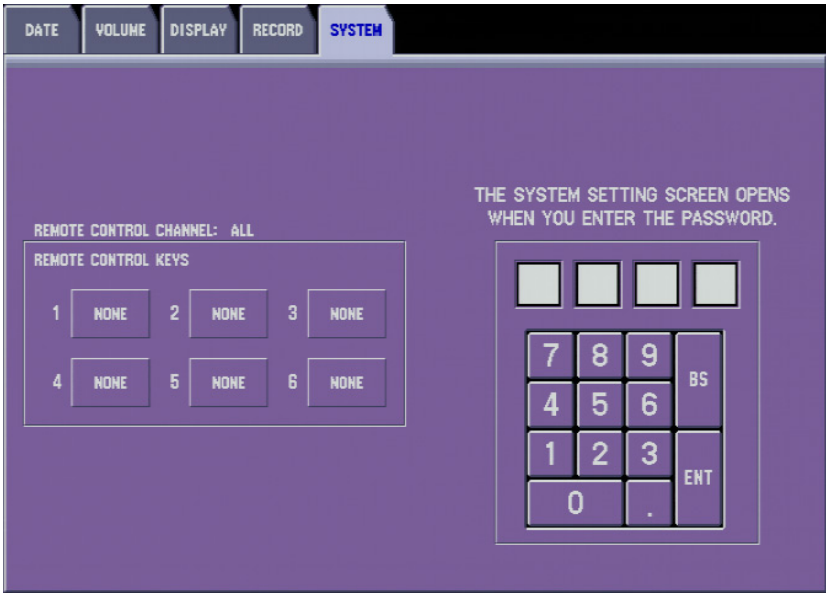
1. Press the [Menu] key on the front panel to display the MENU window.

2. Touch the SYSTEM key on the MENU window.

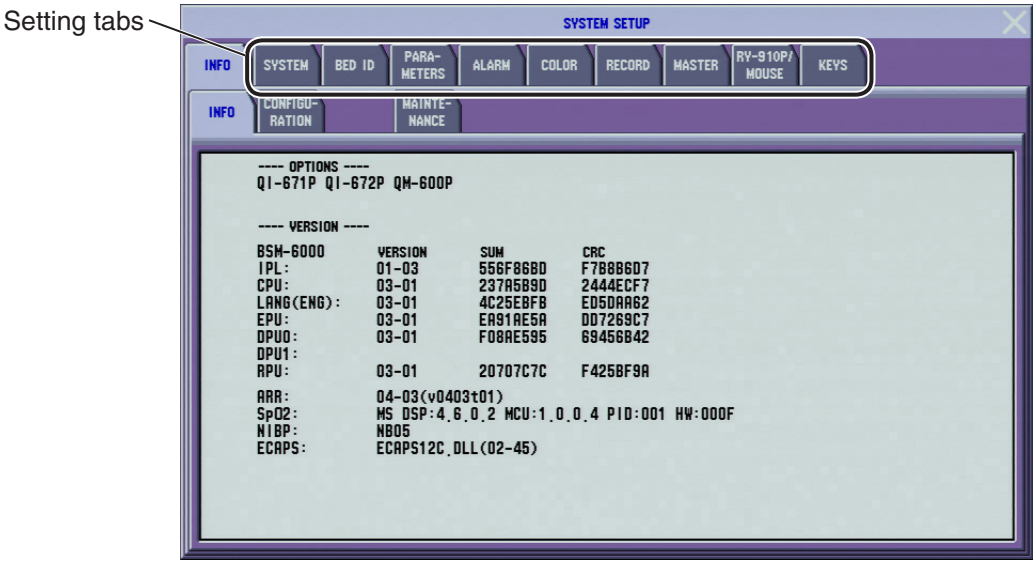


3. Enter the password with the number keys and touch the ENT key. The SYSTEM SETUP window appears. (The default password is “1234”.)

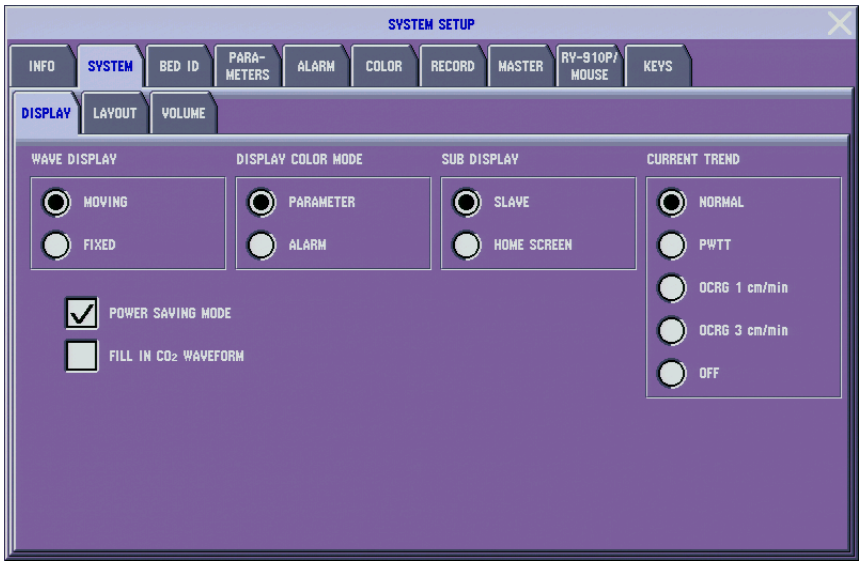
   The password is set on the CHANGE PASSWORD window of the SYSTEM CONFIGURATION screen. Refer to Section 2.



4. Touch the desired setting tab to display the desired window.



5. Change any necessary settings.



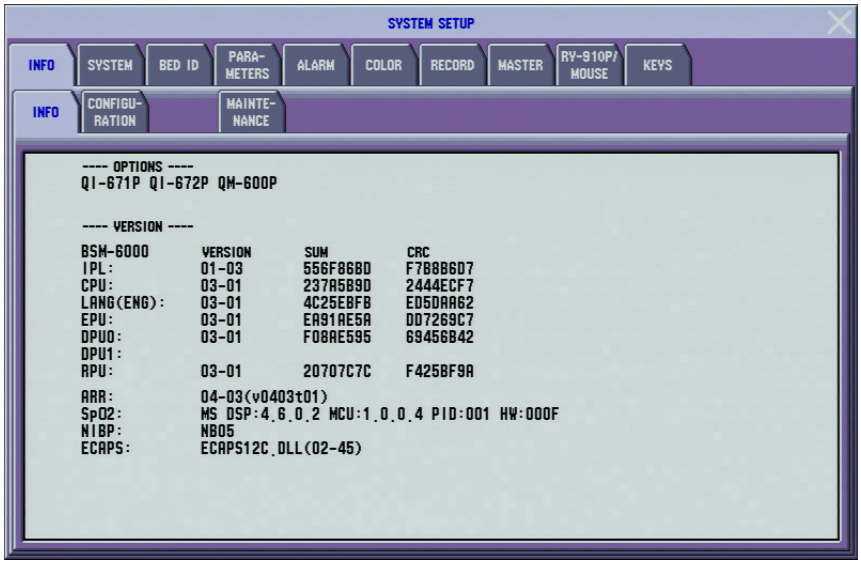
Closing the SYSTEM SETUP Window

Home

Touch the close button (☒) or press the [Home] key. The home screen appears.

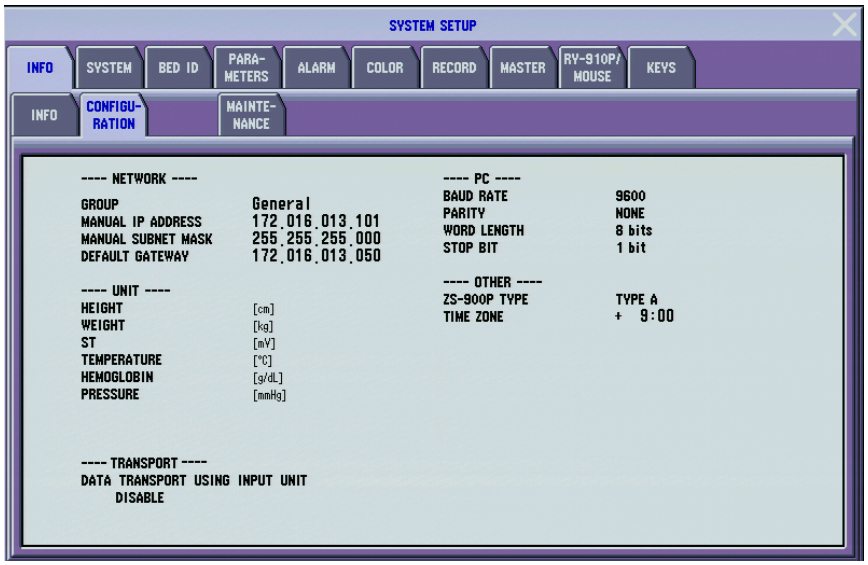
The INFO Page of the INFO Window

The INFO page shows the software version of the monitor. The page also lists the options installed in the monitor.



The CONFIGURATION Page of the INFO Window

The CONFIGURATION page shows the settings on the SYSTEM CONFIGURATION screen of the DIAGNOSTIC CHECK screen. This lets you check the contents of the settings without having to restart the monitor to display the SYSTEM CONFIGURATION screen.



NOTE

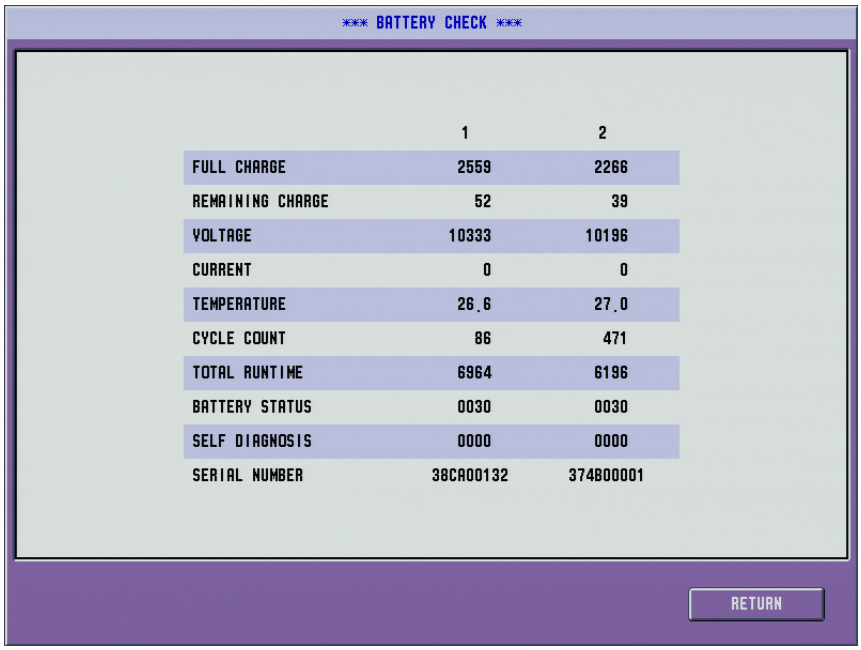
The settings on the SITE and CHANGE PASSWORD windows are not displayed.

The MAINTENANCE Page of the INFO Window

The MAINTENANCE page has two tabs.

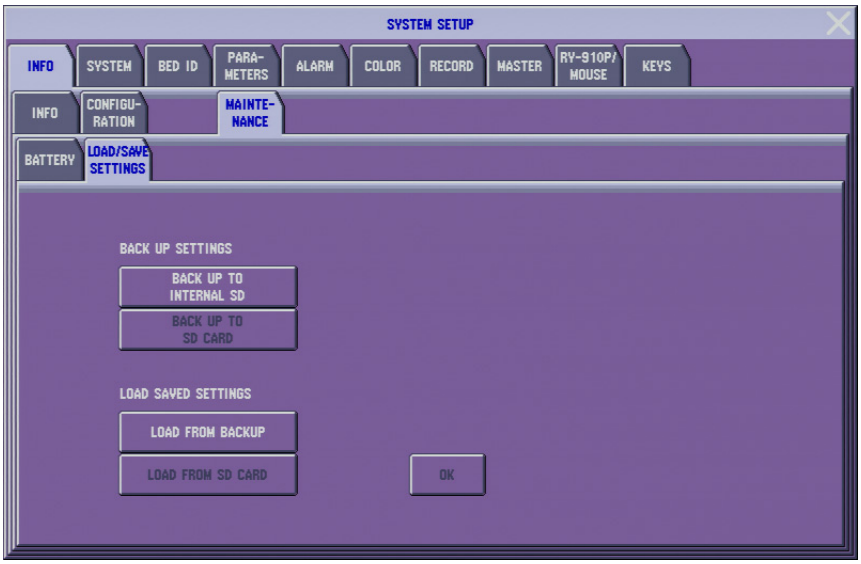
BATTERY Tab

The BATTERY tab shows the status of the batteries installed in the monitor.



LOAD/SAVE SETTINGS Tab

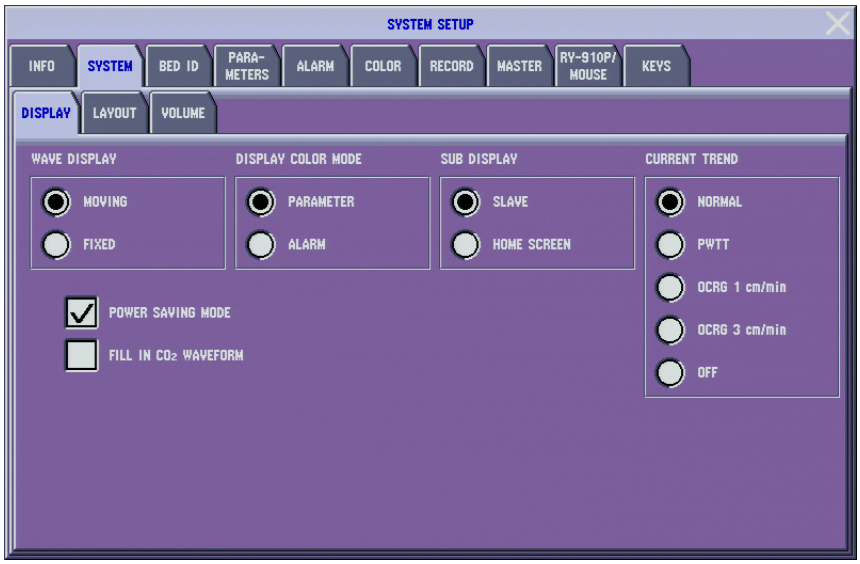
On the LOAD/SAVE SETTINGS tab, you can save settings on the monitor as a file to the SD card and copy the settings to a different monitor. Refer to the Service Manual for details.



SYSTEM Window

The SYSTEM window has four pages.

DISPLAY Page



WAVE DISPLAY: MOVING, FIXED

Select waveform sweep mode on the home screen.
MOVING: Waveform sweeps from the right.
FIXED: Waveform does not sweep; it is refreshed from the left.

DISPLAY COLOR MODE: PARAMETER, ALARM

There are two color display modes.

PARAMETER: A different color can be set for each parameter. When an alarm occurs, the alarmed parameter data is highlighted.

ALARM: The same color selected at <ALARM MODE COLOR> of the COLOR window is set for all parameters. When an alarm occurs, the alarmed parameter color changes according to the color set at <ALARM PRIORITY COLOR> of the ALARM window.

SUB DISPLAY: SLAVE, HOME SCREEN

Select the screen to be displayed on the sub display.

SLAVE: Same screen as the bedside monitor is displayed on the sub display.

HOME SCREEN: The home screen is always displayed.

When FIXED is selected for <WAVE DISPLAY> and HOME SCREEN is selected for <SUB DISPLAY>, trendgraph, PWTT trendgraph and OCRG cannot be displayed.

CURRENT TREND: NORMAL, PWTT, OCRG 1 cm/min, OCRG 3 cm/min, OFF

Select the trendgraph type displayed on the home screen.

NORMAL: Trendgraph

PWTT: PWTT trendgraph

OCRG 1 cm/min: OCRG display with the horizontal scale 1 cm/min

OCRG 3 cm/min: OCRG display with the horizontal scale 3 cm/min

OFF: No trendgraph/PWTT trendgraph/OCRG display on the home screen

POWER SAVING MODE: On, Off

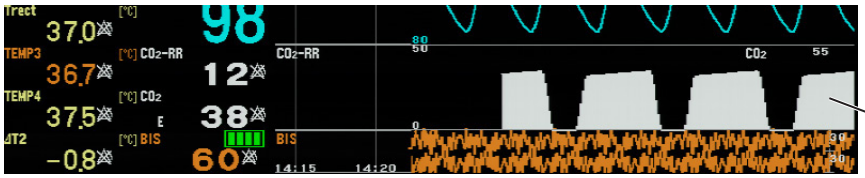
When operating the monitor on battery power, the brightness of the screen can be adjusted to save battery power.

On: Dim, longer battery operation time

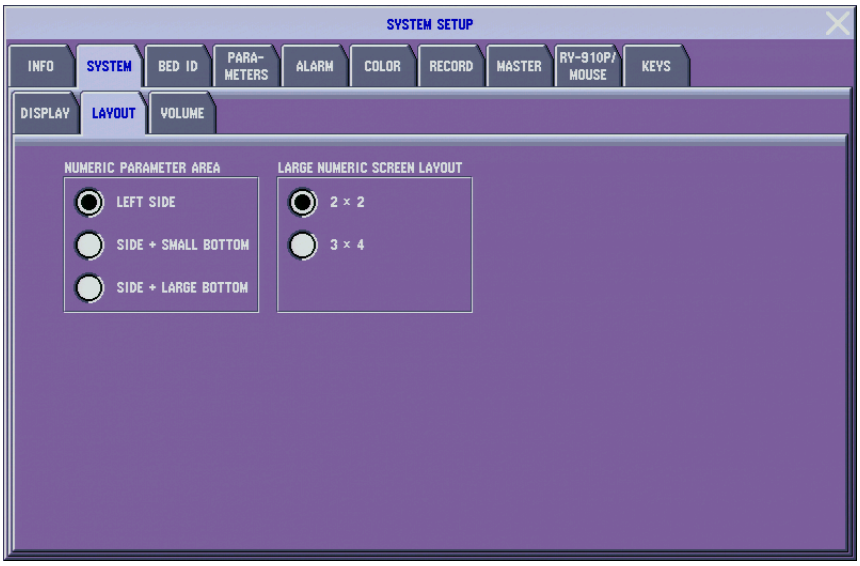
Off: Normal screen brightness, shorter battery operation time

FILL IN CO_2 WAVEFORM: On, Off

When set to On, the CO_2 waveform is filled in.



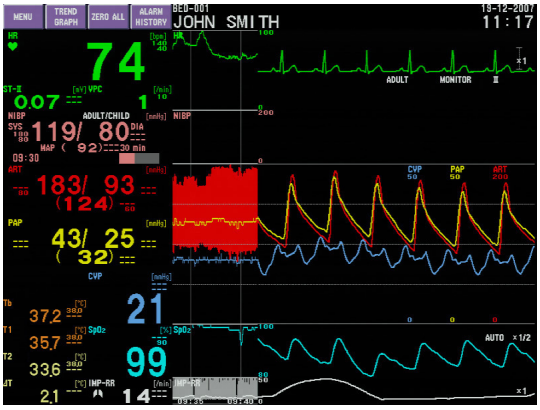
LAYOUT Page



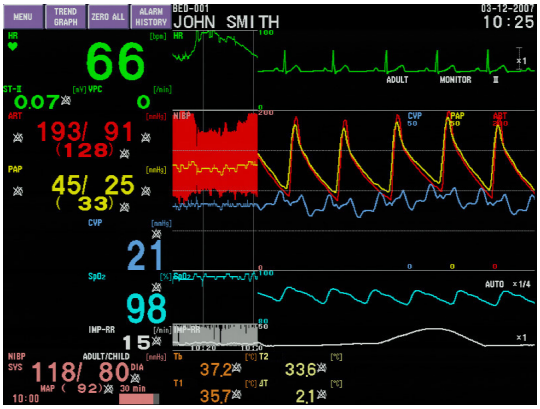
NUMERIC PARAMETER AREA: LEFT SIDE, SIDE + SMALL BOTTOM, SIDE + LARGE BOTTOM

Select the area for displaying numeric values on the home screen.

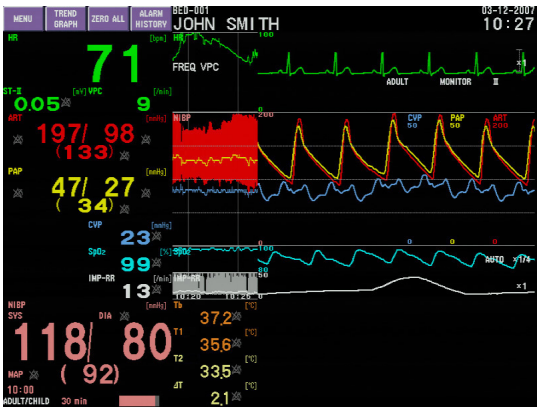
LEFT SIDE: The numeric values are displayed at the left side of the home screen.



SIDE + SMALL BOTTOM: The numeric values are displayed at the left and bottom of the home screen. The values at the bottom of the screen are small.

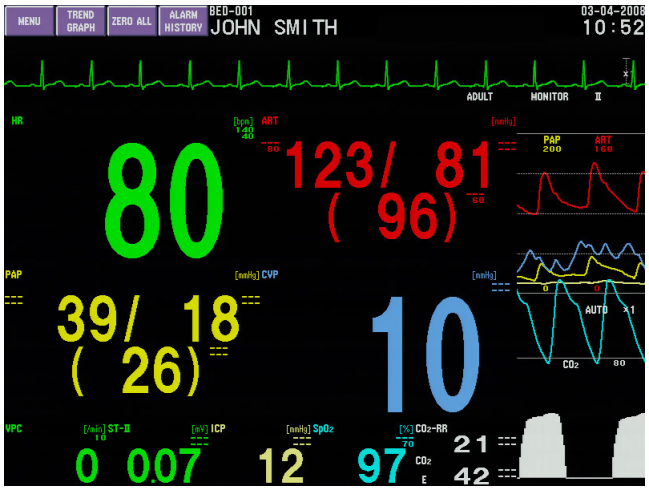


SIDE + LARGE BOTTOM: The numeric values are displayed at the left and bottom of the home screen. The values at the bottom of the screen are large.

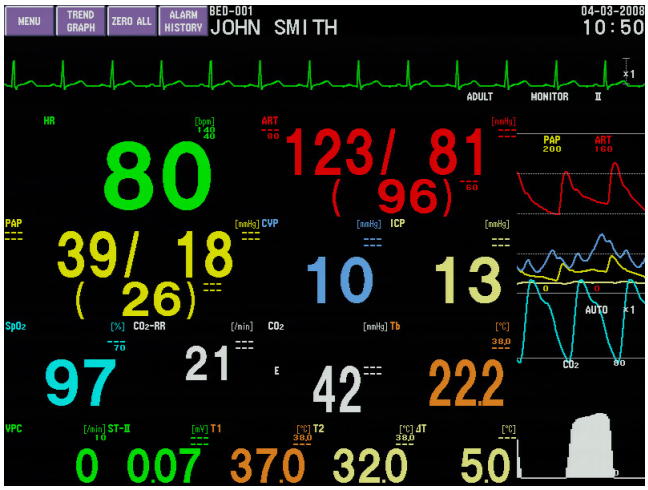


LARGE NUMERIC SCREEN LAYOUT: 2 × 2, 3 × 4

Select the layout type for the LARGE NUMERICS window.

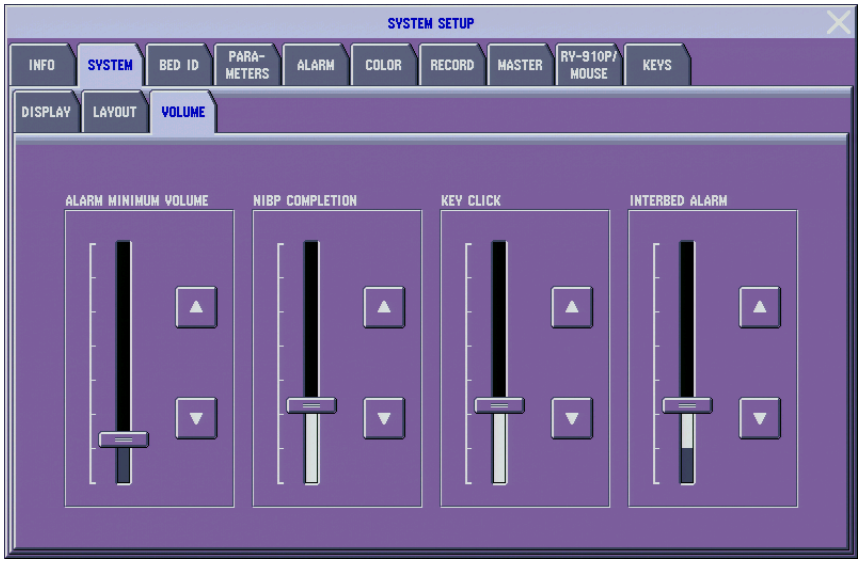


2 × 2



3 × 4

VOLUME Page



ALARM MINIMUM VOLUME

Set the minimum volume for the alarm sound.

NIBP COMPLETION

Set the volume for the NIBP measurement completion sound. The NIBP measurement completion sound is enabled when <COMPLETION SOUND> on the NIBP page of the PARAMETERS window is set to On. When <COMPLETION SOUND> is set to Off or the volume is set to minimum, there is no sound.

KEY CLICK

Set the volume for the click sound when a key on the screen is touched. When set to minimum, there is no click sound.

INTERBED ALARM

Set the volume for the interbed alarm sound. The interbed alarm sound is enabled when <INTERBED ALARM> on the SETTINGS page of the INTERBED window is set to ON. When <INTERBED ALARM> is set to OFF, there is no sound.

BED ID Window

Enter an identification name for the bed. Up to 10 alphanumeric characters can be entered.

CAUTION

When the monitor is connected to a central monitor network, set the Bed Name (Bed ID) and Group Name on the monitor. Otherwise, the default settings are used for the bed name and group name and the bed may be incorrectly identified on the central monitor.

1. Touch the EDIT key. The keyboard appears.

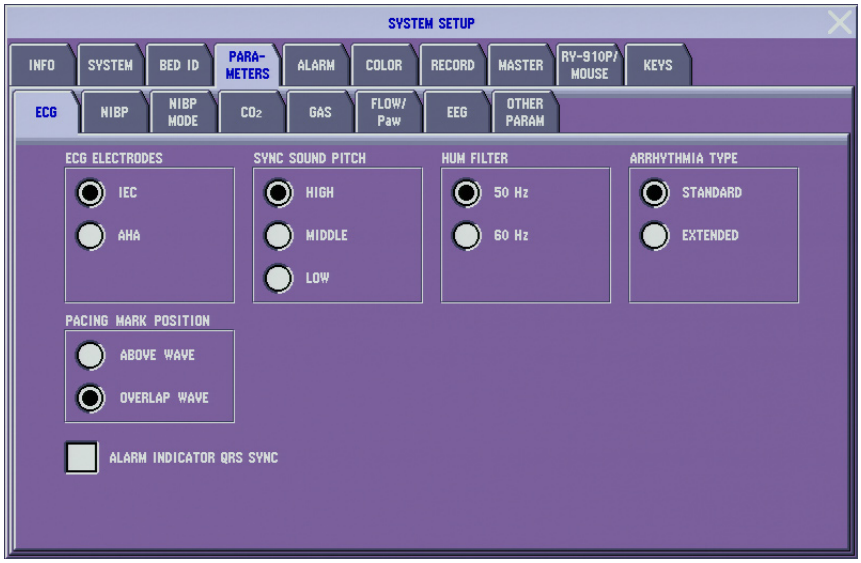
2. Touch the desired letters and numbers to enter the bed ID.

3. Touch the ENT key to register the bed ID.

PARAMETERS Window

The PARAMETERS window has eight pages.

ECG Page



ECG page when site is OR/ICU

ECG ELECTRODES: IEC, AHA

Select the electrode lead type.

IEC: R, L, F, RF, C

AHA: RA, LA, LL, RL, V

SYNC SOUND PITCH: HIGH, MIDDLE, LOW

Select high, middle, or low pitch synchronized sound.

HUM FILTER: 50 Hz, 60 Hz

Select the hum filter.

50 Hz: Set to 50 when operating only in 50 Hz area

60 Hz: Set to 60 when operating only in 60 Hz area

NOTE

Make sure that the appropriate line frequency is selected. Otherwise, noise may interfere on the ECG waveforms.

ARRHYTHMIA TYPE: STANDARD, EXTENDED

This setting is not available on the BSM-6000A series. For BSM-6000A series, arrhythmia type is STANDARD only.

There are 2 patterns of arrhythmia analysis. Normally, use “STANDARD”.

STANDARD: ASYSTOLE, VF, VT, VPC RUN, TACHYCARDIA, BRADYCARDIA, COUPLET, EARLY VPC, BIGEMINY, FREQ VPC, VPC

EXTENDED: ASYSTOLE, VF, VT, EXT TACHY, EXT BRADY, VPC RUN, V BRADY, SV TACHY, TACHYCARDIA, BRADYCARDIA,

PAUSE, COUPLET, EARLY VPC, MULTIFORM, V RHYTHM, BIGEMINY, TRIGEMINY, FREQ VPC, VPC, IRREGULAR RR, PROLONGED RR, NO PACER PULSE, PACER NON-CAPTURE

NOTE

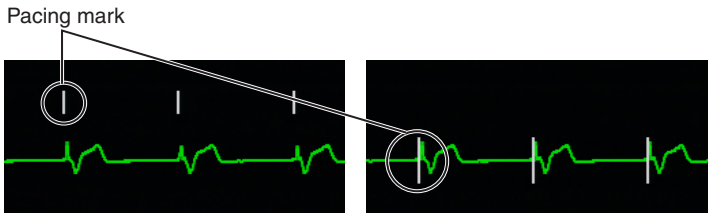
When “EXTENDED” is selected for arrhythmia type and the bedside monitor is connected to a central monitor network that has old software so that “EXTENDED” arrhythmias cannot be monitored, the “COMMUNICATION LOSS” message appears for the bedside monitor and the bedside monitor cannot be monitored on the central monitor.

PACING MARK POSITION: ABOVE WAVE, OVERLAP WAVE

Select the pacing mark position on the ECG waveform displays on the home screen and ECG window.

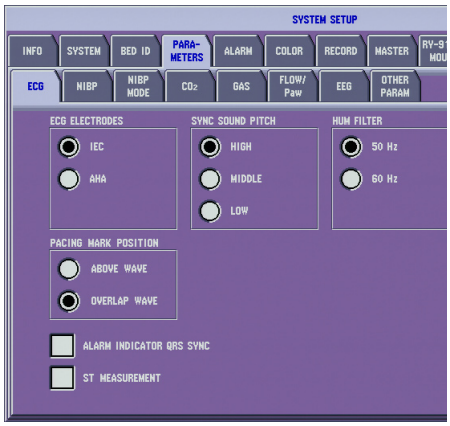
ABOVE WAVE: Pacing mark is displayed above the wave.

OVERLAP WAVE: Pacing mark is displayed overlapping wave.



ALARM INDICATOR QRS SYNC: On, Off

When set to On, the green lamp of the alarm indicator blinks in synchronization with the patient’s QRS.

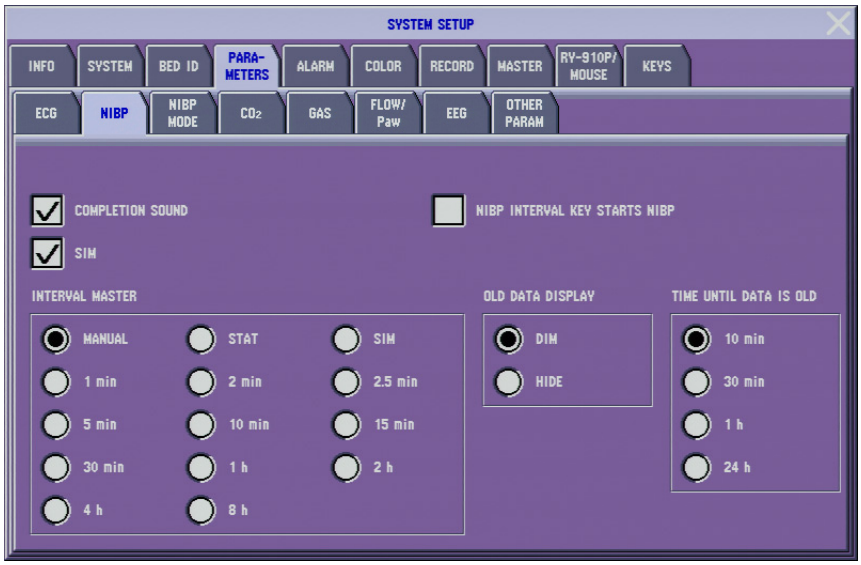


ECG page when site is NICU

ST MEASUREMENT On, Off

ST measurement can be turned on or off . This setting is only available when the site is NICU.

NIBP Page



COMPLETION SOUND: On, Off

When set to On, a “peep” sounds when NIBP measurement is complete. The volume for this sound is set at <NIBP COMPLETION> on the DISPLAY-VOLUME page.

SIM: On, Off

Select On when using SIM mode for NIBP. This setting is only available when the site is OR.

NIBP INTERVAL KEY STARTS NIBP: On, Off

When set to On, the first NIBP measurement starts in auto measurement when [NIBP Interval] key is pressed to select the interval.

INTERVAL MASTER: MANUAL, STAT, SIM, 1, 2, 2.5, 5, 10, 15, 30 min, 1, 2, 4 or 8 h

Select the initial NIBP measurement mode when <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON and 30 minutes elapse after monitor power off or the patient data is deleted. SIM mode is only available when the site is OR and <SIM> is set to On.

OLD DATA DISPLAY: DIM, HIDE

Select whether to dim or hide the NIBP data on the home screen when the time in <TIME UNTIL DATA IS OLD> elapses after the last NIBP measurement.

TIME UNTIL DATA IS OLD: 10 min, 30 min, 1 h or 24 h

Select how long to wait after NIBP measurement to dim or hide the NIBP data on the home screen.

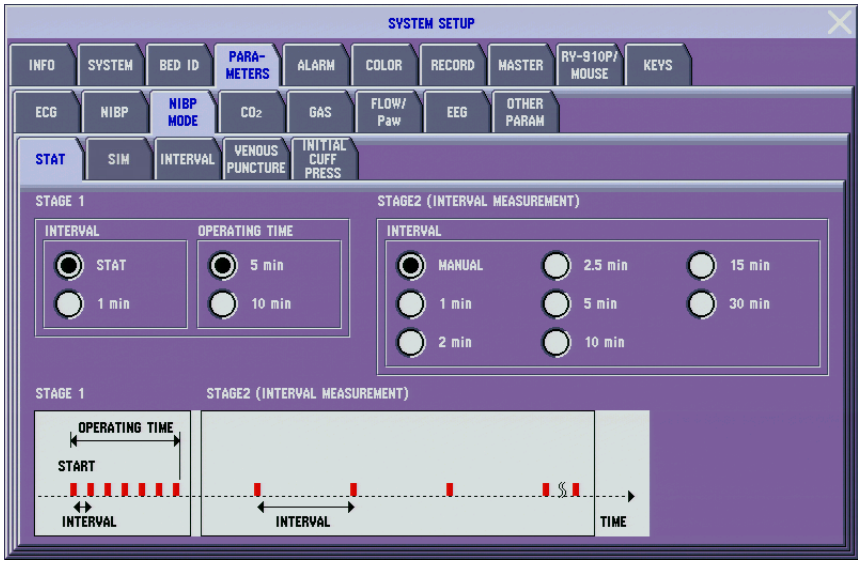
NOTE

When 24 h is selected, the NIBP data is hidden 24 hours after measurement even when DIM is selected for <OLD DATA DISPLAY>.

NIBP MODE Page

The NIBP MODE page has five tabs.

STAT Tab



Set the program for the STAT mode measurement.

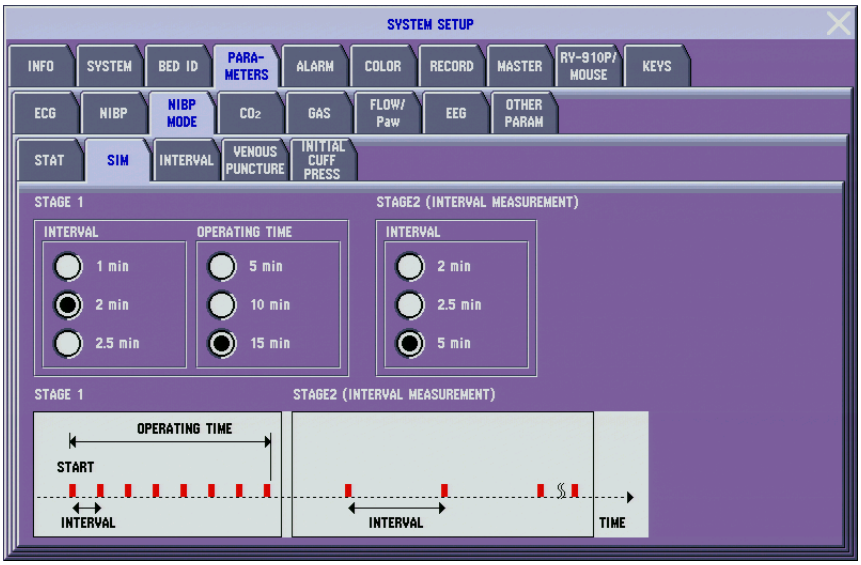
The STAT mode is for measuring blood pressure during induction of general anesthesia. There are two stages. In <STAGE 1>, repetitive measurement is performed at the interval set for <INTERVAL> for the period set for <OPERATING TIME>. After stage 1 finishes, periodic measurement starts at the interval set for <STAGE 2>.

Setting Items

STAGE 1 INTERVAL: STAT/1 min*
STAGE 1 OPERATING TIME: 5 min/10 min
STAGE 2 INTERVAL: MANUAL/1 min/2 min/2.5 min/5 min/10 min/15 min/30 min

* 1 minute interval measurement reduces burden on the patient.

SIM Tab



Set the program for the SIM mode measurement. This tab appears only when <SIM> is set to On on the NIBP page.

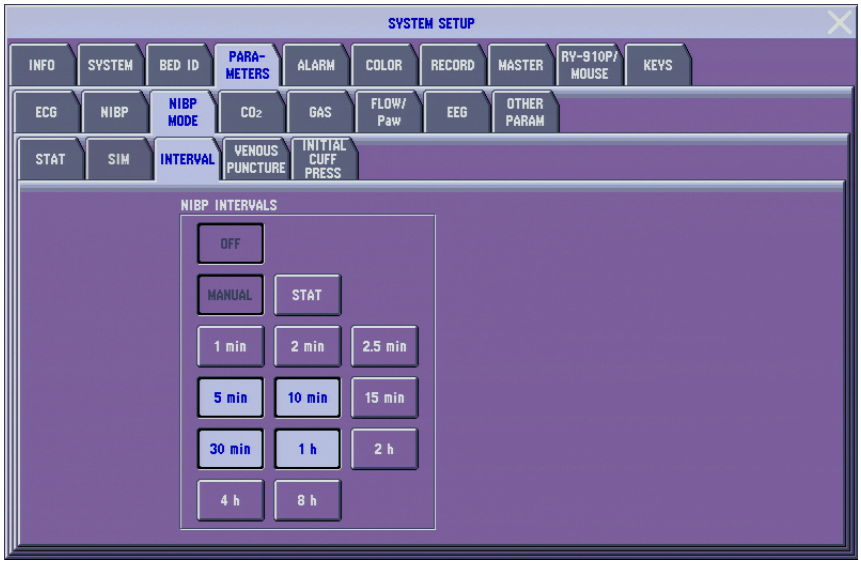
The SIM mode is for measuring blood pressure during infusion of local anesthesia such as spinal anesthesia (also called lumbar anesthesia or subarachnoid block) and epidural anesthesia. There are two stages. In <STAGE 1>, repetitive measurement is performed at the interval set for <INTERVAL> for the period set for <OPERATING TIME>. After stage 1 finishes, periodic measurement starts at the interval set for <STAGE 2>.

Setting Items

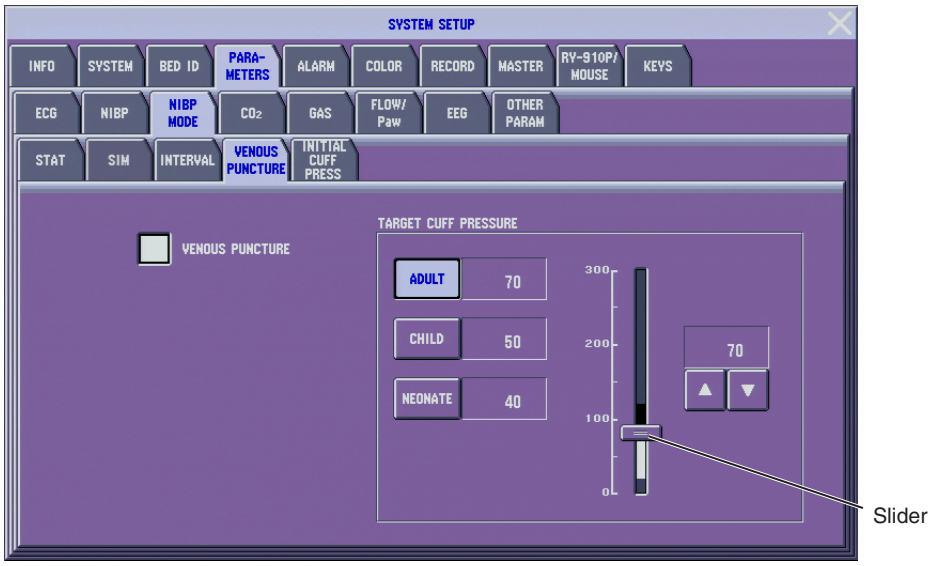
STAGE 1 INTERVAL: 1 min/2 min/2.5 min
STAGE 1 OPERATING TIME: 5 min/10 min/15 min
STAGE 2 INTERVAL: 2 min/2.5 min/5 min

INTERVAL Tab

Select the measurement mode to be displayed on the NIBP INTERVALS window which appears on the left part of the screen when the [NIBP Interval] key is pressed.



VENOUS PUNCTURE Tab



VENOUS PUNCTURE: On, Off

When set to On, venous puncture mode is available for NIBP.

TARGET CUFF PRESSURE

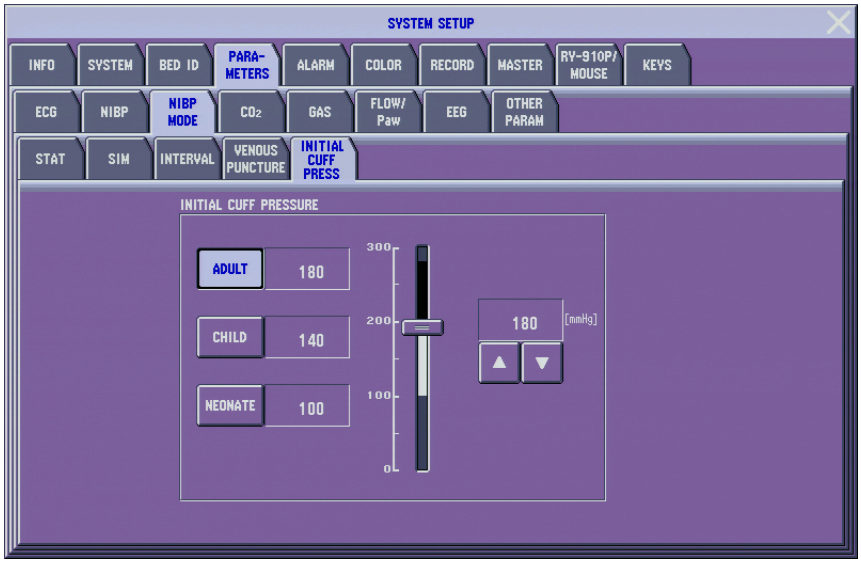
Set the maximum cuff pressure for each patient type in venous puncture mode.

1. Select the patient type by touching the ADULT, CHILD or NEONATE key.

2. Touch and drag the slider to select the cuff pressure. Use the ▲ or ▼ key to adjust setting.

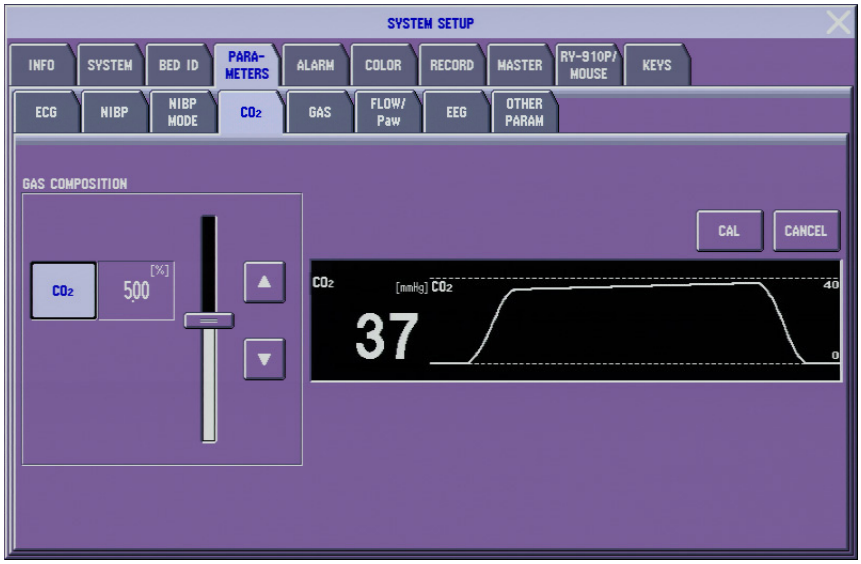
INITIAL CUFF PRESS Tab

Set the master setting for the initial cuff inflation pressure. When a patient is admitted or discharged, or <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON and 30 minutes elapse after monitor power off, the initial cuff inflation pressure on the NIBP window return to this master setting.



CO_2 Page

Use this page for inspecting CO_2 measurement accuracy. For details, refer to the Service Manual.



GAS Page

The GAS page has three tabs.

NOTE

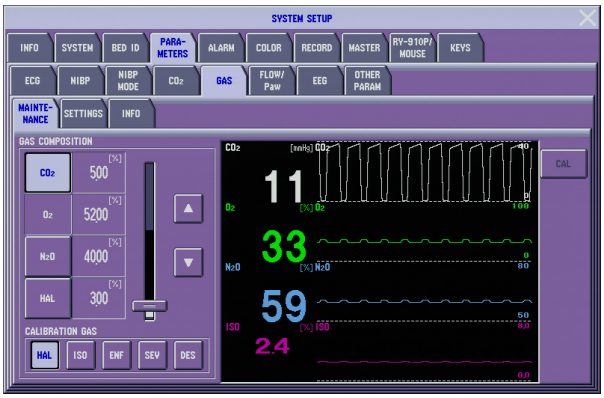
GF-210R multigas unit and GF-120PA or GF-220R multigas/flow unit are not available for the BSM-6000A series.

MAINTENANCE Tab

Use this page for gas calibration. For details, refer to the Service Manual.

CAUTION

When the monitoring value is not appropriate, perform gas calibration. Perform gas calibration once a year for stable measuring accuracy.

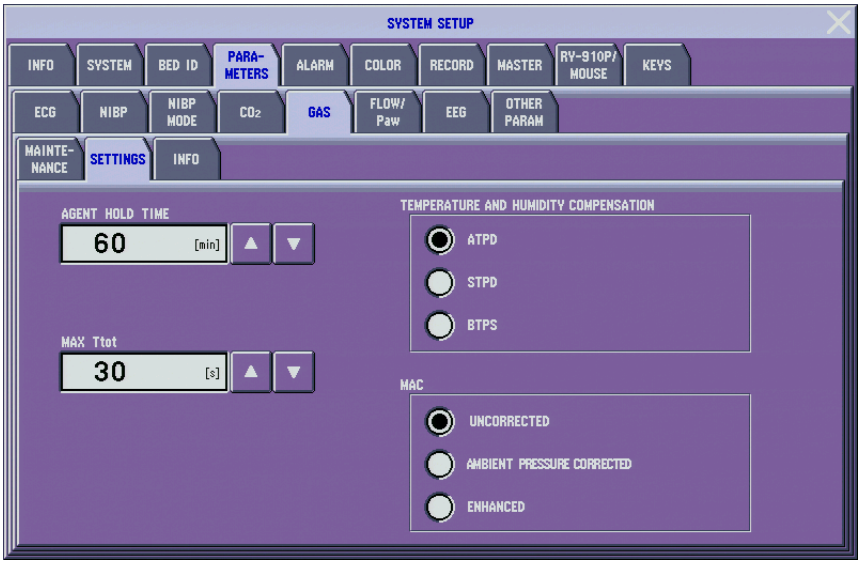


MAINTENANCE page when GF-110PA or GF-120PA is connected

MAINTENANCE page when GF-210R or GF-220R is connected

SETTINGS Tab

Set the settings on the SETTINGS tab when monitoring anesthetic gas with a GF-110PA or GF-210R multigas unit or GF-120PA or GF-220R multigas/flow unit.



AGENT HOLD TIME: 10 to 60 min (5 min steps)

Set the time to delete the anesthetic agent data from the home screen after the end of gas monitoring.

MAX Ttot: 20 to 40 s (5 s steps)

Set the time to display spontaneous value instead of Fi/ET values for gas values when there is apnea.

TEMPERATURE AND HUMIDITY COMPENSATION: ATPD, STPD, BTPS

Select the temperature and humidity for compensating the gas measurement values (it is assumed that the sensor temperature is 22ºC (71.6ºF) and humidity 40%).

ATPD: Ambient Temperature 25ºC (77ºF), atmospheric Pressure, Dry (0%)

STPD: Standard Temperature 0ºC (32ºF), 1 atmospheric Pressure, Dry (0%)

BTPS: Body Temperature 37ºC (98.6ºF), atmospheric Pressure, Saturated (100%)

MAC: UNCORRECTED, AMBIENT PRESSURE CORRECTED, ENHANCED

NOTE

This setting is not available on the BSM-6000A series.

Select the type of MAC to be displayed. For details on the MAC calculation method, refer to the GF-110PA or GF-210R multigas unit or GF-120PA or GF-220R multigas/flow unit Operator's Manual.

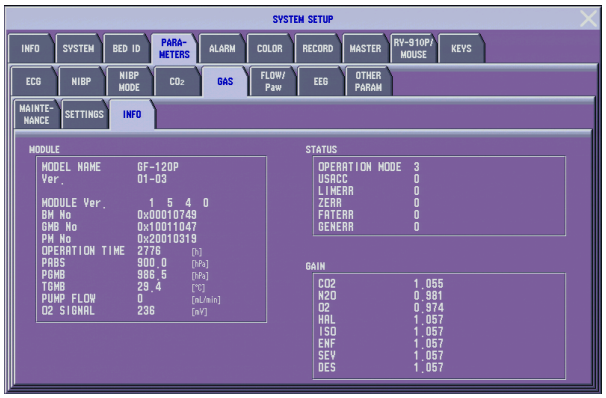
UNCORRECTED:	Displays uncorrected MAC. Labeled "MAC" on the screen.
AMBIENT PRESSURE CORRECTED:	Displays ambient pressure-corrected

MAC. Labeled “MAC-Ambnt” on the screen.

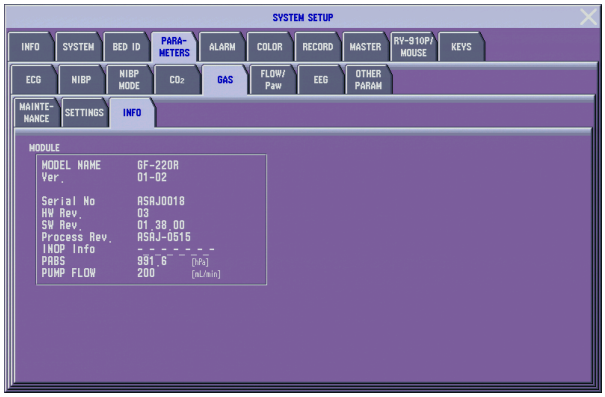
ENHANCED: Displays enhanced MAC correction. Labeled “MAC-Enhnc” and “MAC-Awake” on the screen.

INFO Tab

The INFO tab shows information about the GF-110PA or GF-210R multigas unit or GF-120PA or GF-220R multigas/flow unit. For details, refer to the Service Manual.



INFO page when GF-120PA is connected



INFO page when GF-220R is connected

FLOW/Paw Page

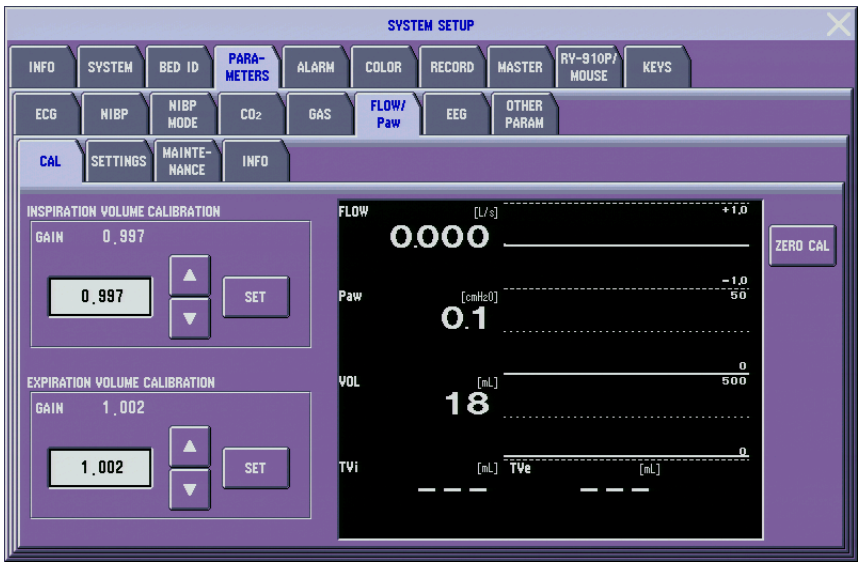
The FLOW/Paw page has four tabs.

NOTE

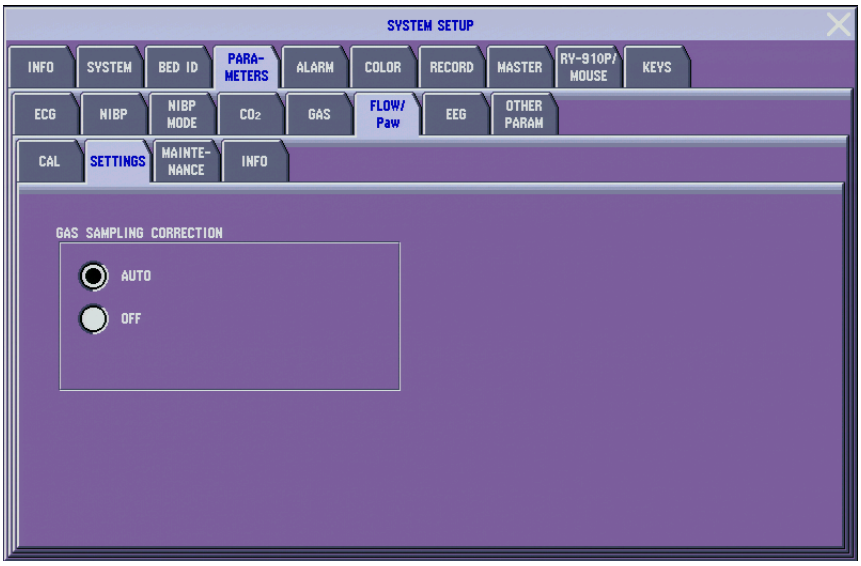
GF-120PA and GF-220R multigas/flow unit are not available for BSM-6000A series.

CAL Tab

Use this page for gas calibration. For details, refer to the Service Manual.



SETTINGS Tab



GAS SAMPLING CORRECTION: AUTO, OFF

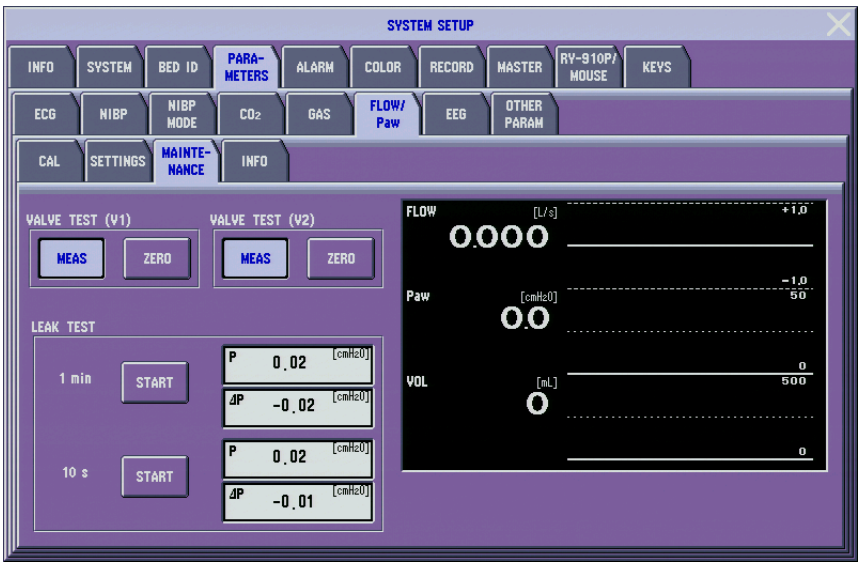
This setting is available only when using a GF-120PA or GF-220R multigas/flow unit. When the sampling line for gas monitoring is attached to the sampling port on the flow adapter or connected between the flow tube and patient, there will be a difference between the ventilation volume setting on the anesthetic machine and the actual ventilated volume of the patient because of the gas sampled by the multigas/flow unit. This difference is compensated for in flow measurement when this item is set to AUTO. For example, if the sampling volume is set to 200 mL/min on the GAS window, 3.3 mL/min is subtracted from the measured flow value. The flow volumes are also calculated from the compensated flow value.

AUTO: When <GAS MEASUREMENT> on the GAS window is set to On, the flow value is compensated whenever patient respiration is detected by the monitor.

OFF: No compensation.

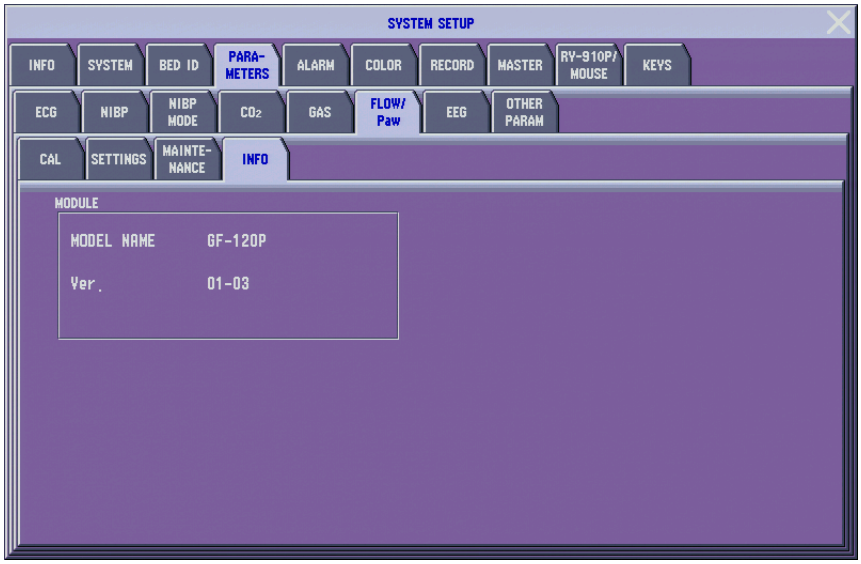
MAINTENANCE Tab

Use this page for inspecting the GF-120PA or GF-220R multigas/flow unit. For details, refer to Service Manual.



INFO Tab

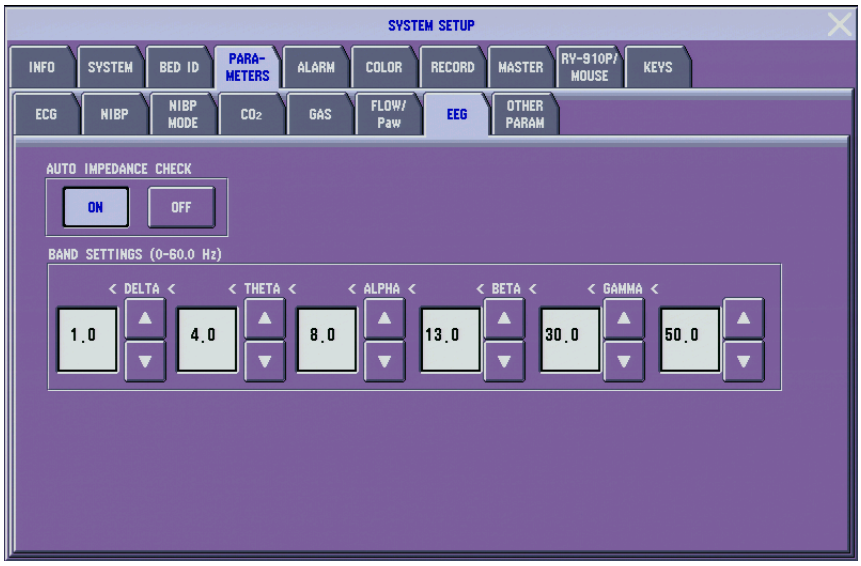
The INFO tab shows the model and software version of the GF-120PA or GF-220R multigas/flow unit.



EEG Page

NOTE

AE-918P neuro unit is not available for BSM-6000A series.



AUTO IMPEDANCE CHECK: ON, OFF

When auto check is turned On, measurement signals of two frequencies higher than the EEG frequency band are applied to check impedance while measuring EEG. If the result is not “PASS”, the “CHECK ELECTRODES” or “HIGH IMPEDANCE” message appears on the screen.

The impedance for the Z electrode cannot be automatically checked. Check impedance for the Z electrode manually.

CAUTION

Never check the skin-electrode impedance with the needle electrode inserted in the patient. Failure to follow this caution causes electrical burn where electrodes are inserted.

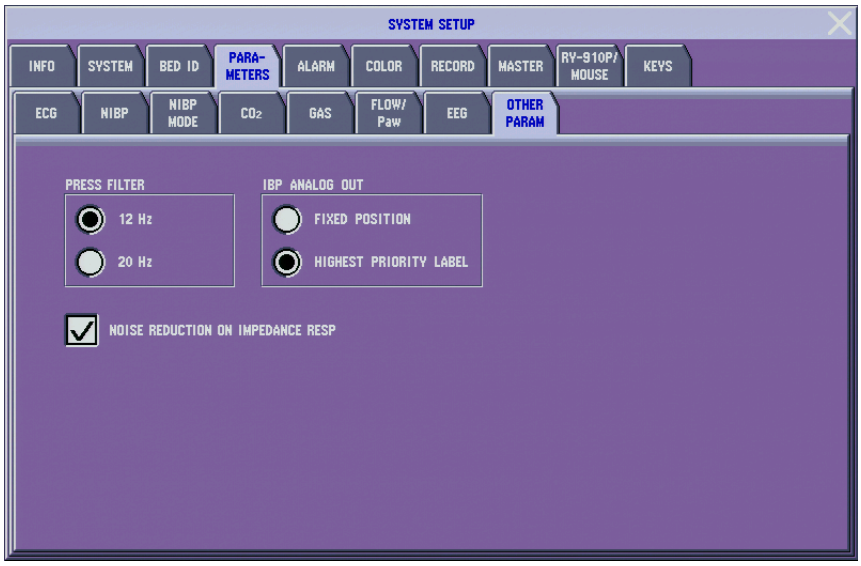
NOTE

It is recommended to use auto impedance check function so that electrode off, lead disconnection and high impedance of an electrode can be automatically detected. However, noise from the automatic impedance check may affect other devices. In that case, set the automatic impedance check to Off.

BAND SETTINGS: 0 to 60.0 Hz

If necessary, change the frequency band setting.

OTHER PARAM Page



PRESS FILTER: 12 Hz, 20 Hz

Select the noise filter for IBP monitoring. For normal monitoring, set the filter to 12 Hz. To see the IBP waveforms in detail, set the filter to 20 Hz.

IBP ANALOG OUT: FIXED POSITION, HIGHEST PRIORITY LABEL

Select the IBP output condition.

FIXED POSITION: IBP line connected to the top MULTI socket on the input unit is used for IBP output.

HIGHEST PRIORITY LABEL: IBP line of the highest priority label is used for IBP output.

Label priority: ART > ART2 > RAD > DORS > AO > FEM > UA > LVP > P1 > P2 > P3 > P4 > P5 > P6 > P7

NOISE REDUCTION ON IMPEDANCE RESP: On, Off

In the impedance method, noise from the heart beat may interfere on the respiration waveform due to electrode position, and the respiration rate may increase to almost the same rate as the heart rate. In such a case, set this setting to On to reduce noise interference on the respiration waveform.

If the respiration rate is miscounted in the thermistor method, set this item to Off.

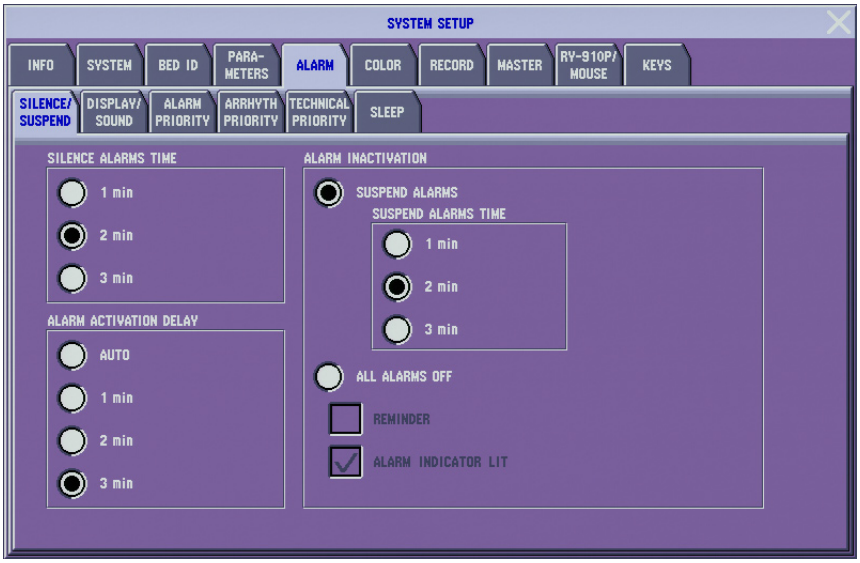
NOTE

When this item is set to On and the timing of the respiration and heart beat coincide, respiration rate might not be counted. In such a case, set this item to Off or check the patient's respiration by observing the patient's chest movement or the respiration waveform on the screen.

ALARM Window

The ALARM window has six pages.

SILENCE/SUSPEND Page



SILENCE/SUSPEND page when site is ICU/NICU

SILENCE ALARMS TIME: 1, 2 or 3 min

Select the interval for silencing an alarm.

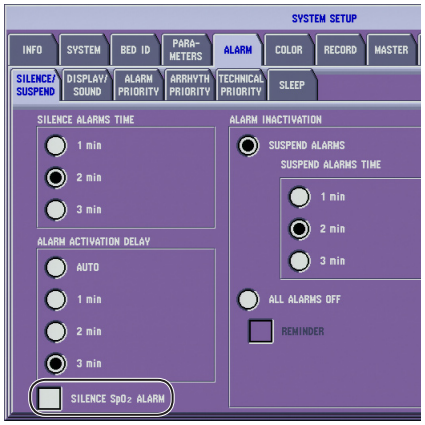
ALARM ACTIVATION DELAY: AUTO, 1, 2 or 3 min

To prevent unnecessary alarms immediately after monitoring starts or monitoring resumes, alarm activation can be delayed for a short time. For details, refer to Operator's Manual or Section 5 of the User's Guide Part I.

AUTO: Alarm function activates when ECG, SpO_2 or IBP is monitored or NIBP is measured and a value is displayed.

1, 2, 3 min: Alarm function activates when one of the following requirements is met.

- ECG, SpO_2 or IBP is continuously monitored for the selected time.
- NIBP is measured.
- Heart rate becomes 0.

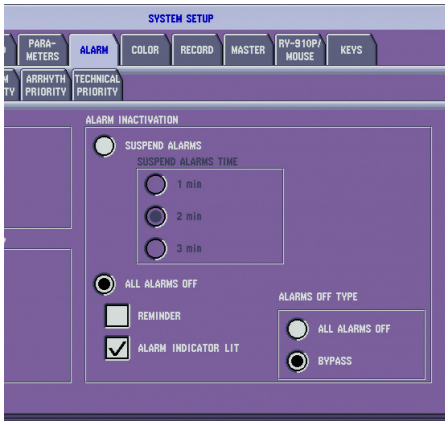


SILENCE SpO_2 ALARM: On, Off

This setting is not available for BSM-6000K series. Select what happens when another alarm occurs during SpO_2 alarm silence.

On: SpO_2 alarms are handled differently than other alarms. When an SpO_2 upper/lower limit alarm is silenced and another alarm which is not SpO_2 upper/lower limit alarm occurs during alarm silence, the alarm sound, indication and recording occur as usual. If another SpO_2 upper/lower limit alarm occurs during SpO_2 alarm silence, the alarm silence continues and the second SpO_2 alarm is not indicated.

Off: All alarm types are handled the same way. When an SpO_2 upper/lower limit alarm is silenced and another alarm occurs during alarm silence, the alarm sound, indication and recording occur as usual.



SILENCE/SUSPEND page when site is OR

ALARM INACTIVATION: SUSPEND ALARMS, ALL ALARMS OFF

Select the alarm off mode. The selected mode appears as the alarm off key on the MENU window.

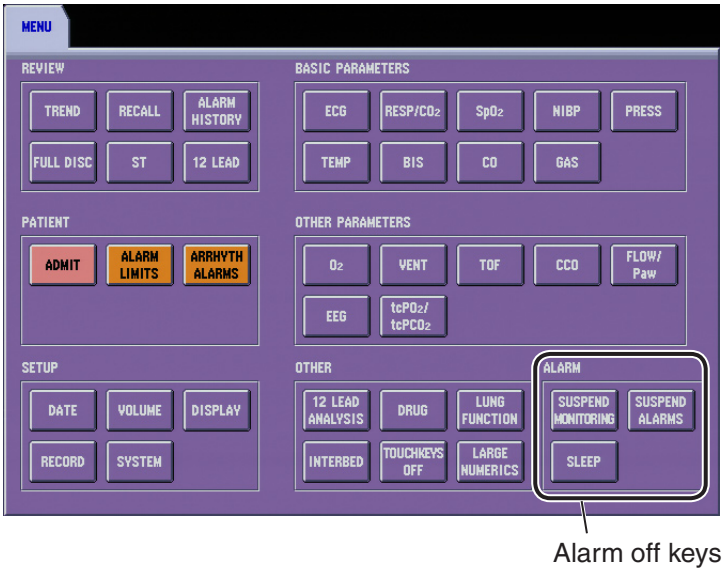
SUSPEND ALARMS: Alarm function is suspended for the selected interval. Select the interval in the <SUSPEND ALARMS TIME> box.

ALL ALARMS OFF: Alarm function is suspended indefinitely. When the site is OR, select the alarm off type in the <ALARMS OFF TYPE> box.

REMINDER: When this item is checked, the "ALL ALARMS OFF" or "BYPASS" message blinks for 3 seconds every 3 minutes. When this item is unchecked, the message does not blink.

ALARM INDICATOR LIT: When this item is checked, the red lamp of the alarm indicator lights when all alarms are off.

The alarm off key on the MENU window



Alarm off keys

ALARM INACTIVATION setting	ICU/NICU site	OR site
SUSPEND ALARMS		
ALL ALARMS OFF		ALARMS OFF TYPE: BYPASS ALARMS OFF TYPE: ALL ALARMS OFF

Alarm off function

SUSPEND MONITORING key

Use this key to temporarily stop patient monitoring for examination. When this key is touched, all alarms and NIBP STAT/SIM and auto measurements are suspended. Alarms resume when the SUSPEND MONITORING key is touched again or when the <ALARM ACTIVATION DELAY> condition is met.

SUSPEND ALARMS key

Use this key to suspend all alarms for the time set in <SUSPEND ALARMS TIME>.

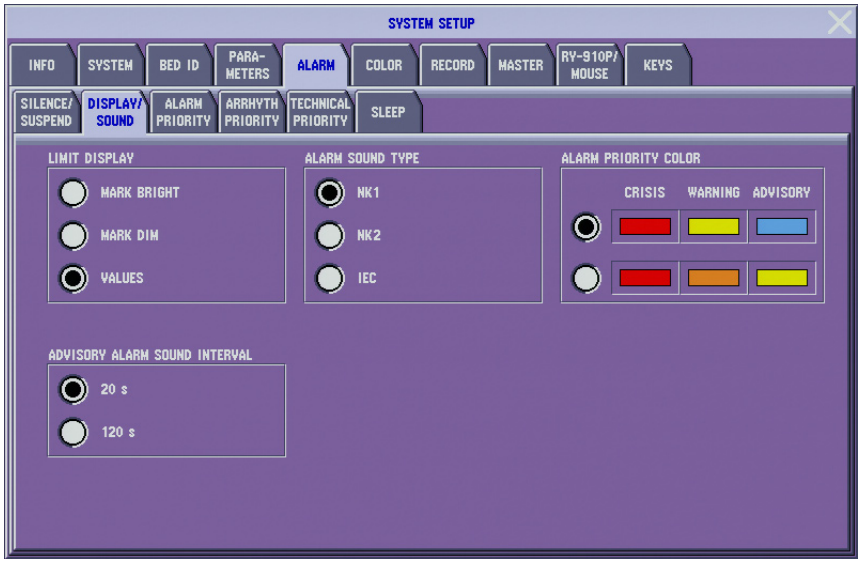
BYPASS key

Use this key when the patient is connected to a heart-lung machine. When this key is touched, all alarms and NIBP STAT/SIM and auto measurements are indefinitely suspended. Touch the BYPASS key and touch the YES key on the confirmation window. Alarms resume when the BYPASS key is touched again.

ALL ALARMS OFF key

Use this key to suspend all alarms indefinitely. Touch the ALL ALARMS OFF key and touch the YES key on the confirmation window. Alarms resume when the ALL ALARMS OFF key is touched again.

DISPLAY/SOUND Page



LIMIT DISPLAY: MARK BRIGHT, MARK DIM, VALUES

Select the alarm off mark display on the screen.

MARK BRIGHT: A normal brightness alarm off mark is displayed beside each parameter value whose vital signs alarm is set to OFF.

MARK DIM: A dimmed alarm off mark is displayed beside each parameter value whose vital signs alarm is set to OFF.

VALUES: The upper/lower alarm limits are displayed beside parameter values. For BSM-6000A series, when the limit is set to OFF, “OFF” is displayed. For BSM-6000K series, when the limit is set to OFF, “---” is displayed.

ALARM SOUND TYPE: NK1, NK2, IEC

Select the alarm sound standard.

NK1 and NK2: Nihon Kohden specified sound

IEC: IEC defined sound

ALARM SOUND TYPE setting	CRISIS	WARNING	ADVISORY
NK1	Continuous pip sound	Continuous ping sound	Single beep every 20 or 120 seconds
NK2	Continuous ping sound	Continuous ding ding sound	Single beep every 20 or 120 seconds
IEC	IEC standard (ceg-gC)	IEC standard (ceg)	IEC standard (ec)

ALARM PRIORITY COLOR

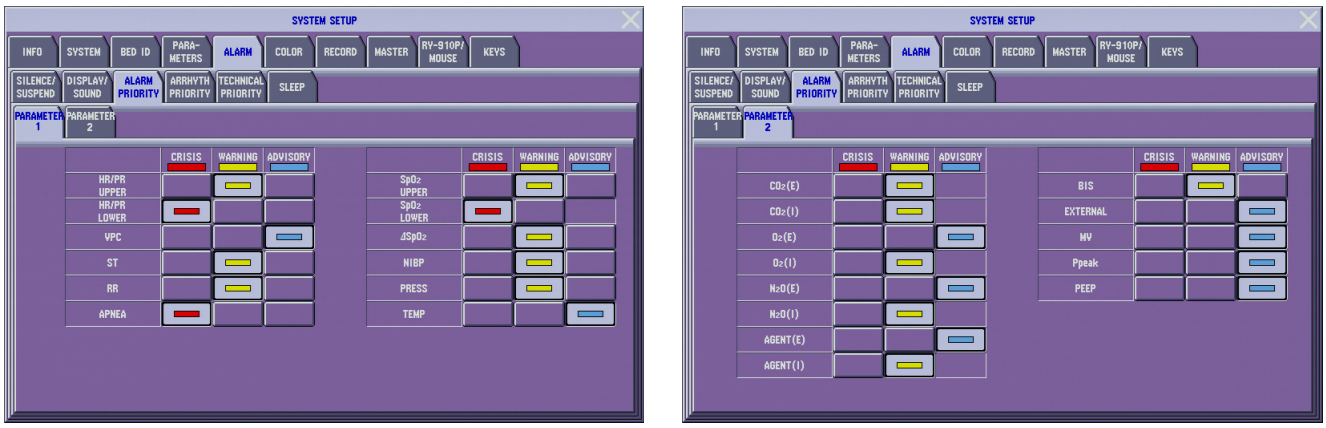
Select the combination of colors for the alarmed parameter when <DISPLAY COLOR MODE> is set to ALARM on the SYSTEM window.

ADVISORY ALARM SOUND INTERVAL: 20 s, 120 s

Select the sound interval for advisory level alarms.

ALARM PRIORITY Page

The ALARM PRIORITY page has two tabs.



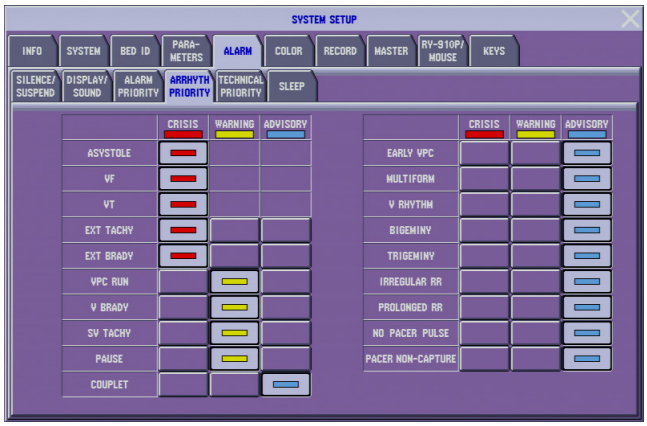
Select the alarm level and alarm indicator color for each parameter. The color combination depends on the <ALARM PRIORITY COLOR> setting on the DISPLAY/SOUND page.

CRISIS: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> and red blinking lamp.

WARNING: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> and yellow blinking lamp.

ADVISORY: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> every 20 or 120 seconds (interval selected at <ADVISORY PRIORITY ALARM SOUND INTERVAL>) and cyan or yellow (color selected at <ALARM PRIORITY COLOR>) lamp lit.

ARRHYTH PRIORITY Page



ARRHYTH PRIORITY page when ARRHYTHMIA TYPE is EXTENDED

ARRHYTH PRIORITY page when ARRHYTHMIA TYPE is STANDARD

Select the alarm level and alarm indicator color for each arrhythmia type. The color combination depends on the <ALARM PRIORITY COLOR> setting on the DISPLAY/SOUND page.

NOTE

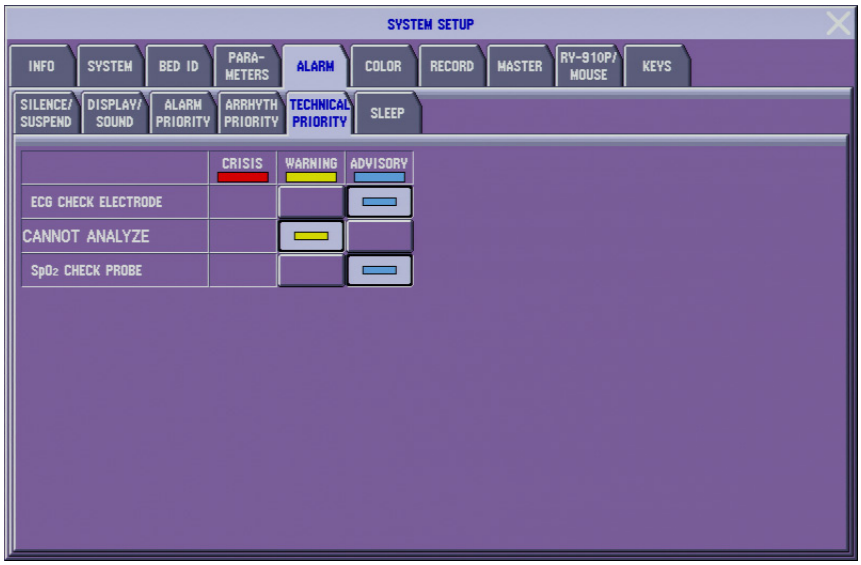
The arrhythmia type setting is not available on the BSM-6000A series. For BSM-6000A series, arrhythmia type is STANDARD only.

CRISIS: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> and red blinking lamp.

WARNING: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> and yellow blinking lamp.

ADVISORY: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> every 20 or 120 seconds (interval selected at <ADVISORY PRIORITY ALARM SOUND INTERVAL>) and cyan or yellow (color selected at <ALARM PRIORITY COLOR>) lamp lit.

TECHNICAL PRIORITY Page

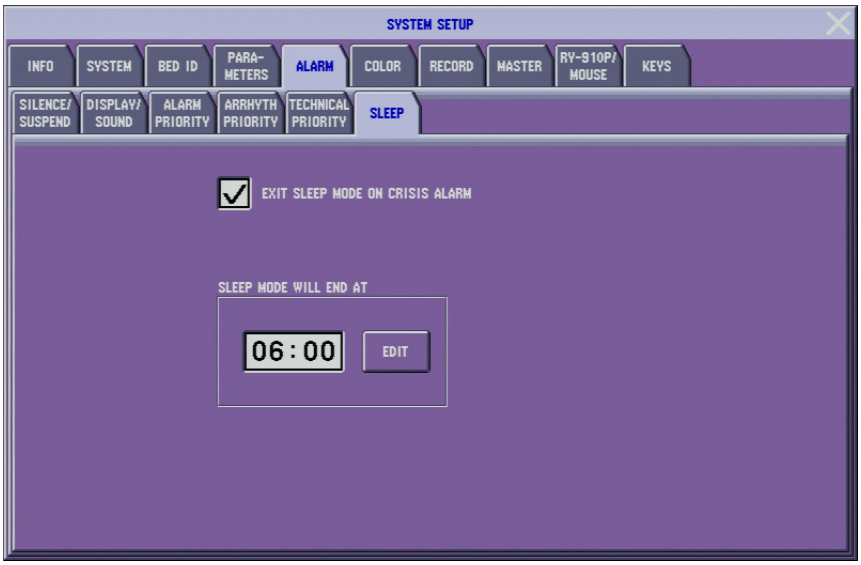


Select the alarm level and alarm indicator color for the three technical alarms. The color combination depends on the <ALARM PRIORITY COLOR> setting on the DISPLAY/SOUND page.

WARNING: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> and yellow blinking lamp.

ADVISORY: The parameter data is highlighted with a sound selected at <ALARM SOUND TYPE> every 20 or 120 seconds (interval selected at <ADVISORY PRIORITY ALARM SOUND INTERVAL>) and cyan or yellow (color selected at <ALARM PRIORITY COLOR>) lamp lit.

SLEEP Page



EXIT SLEEP MODE ON CRISIS ALARM: On, Off

WARNING

When using sleep function, monitor the patient on the central monitor or telemetry system. Otherwise, the bedside monitor alarm may be overlooked. When <EXIT SLEEP MODE ON CRISIS ALARM> check box on the ALARM page of the SYSTEM SETUP window is Off, bedside monitor alarms and sync sound appear on the central monitor but do not appear on the bedside monitor during sleep mode.

On: When a crisis alarm occurs during sleep mode, the sleep mode is exited and the home screen appears. When an alarm other than crisis occurs, sleep mode continues.

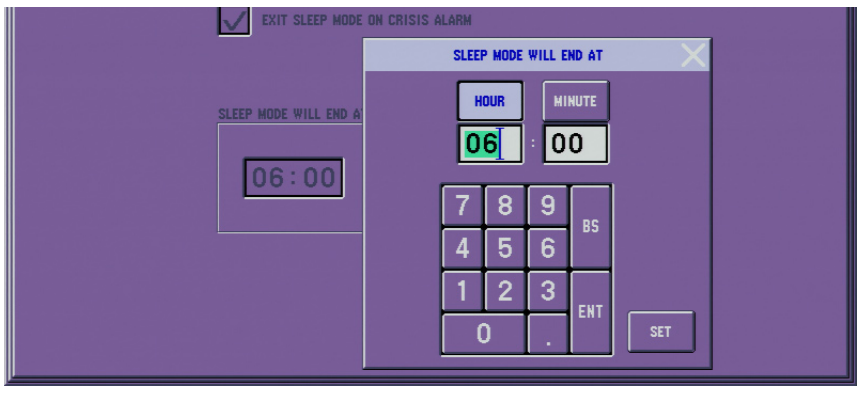
Off: The sleep mode continues even when a crisis alarm occurs.

SLEEP MODE WILL END AT

Set the clock time to exit sleep mode.

1. Touch the EDIT key in the <SLEEP MODE WILL END AT> box.

2. Enter the clock time with the number keys on the screen.



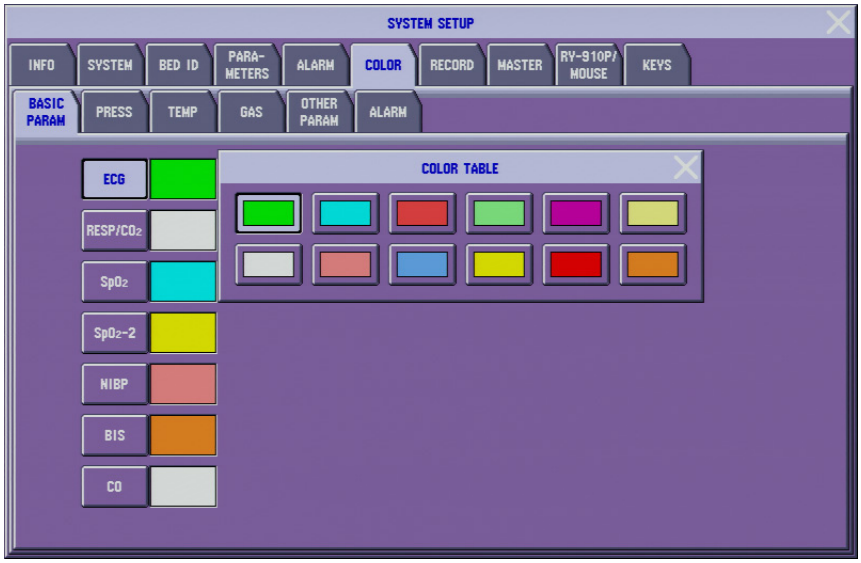
3. Touch the ENT key to register the time.

COLOR Window

Select the color for each parameter display. To display the parameters in different colors, the <DISPLAY COLOR MODE> on the SYSTEM window must be set to PARAMETER.

1. Touch the parameter key. The COLOR TABLE window appears.

2. Select the desired color for the parameter.



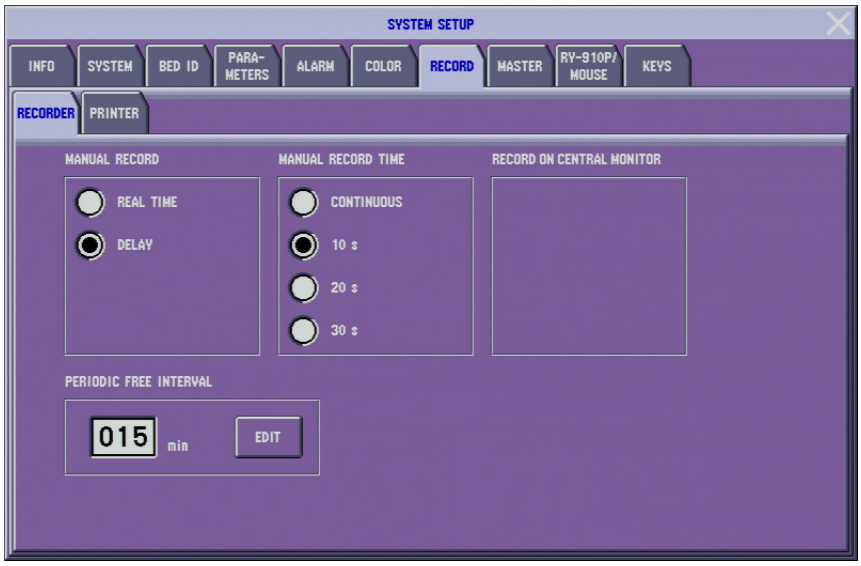
3. Touch the close button ( ) to close the COLOR TABLE window.

When ALARM is selected for the <DISPLAY COLOR MODE> on the SYSTEM window, all parameters are displayed in the same color. Select the color for all parameter display on the ALARM page.

RECORD Window

The RECORD window has two pages.

RECORDER Page



MANUAL RECORD: REAL TIME, DELAY

There are two manual recording modes.

REAL TIME: The beginning of the recorded waveform is when the RECORD key on the screen is touched or the [⧘ record] key on the front panel is pressed.

DELAY: The beginning of the recorded waveform is 8 seconds before the RECORD key on the screen is touched or 8 seconds before the [⧘ record] key on the front panel is pressed.

When manually recording on a central monitor recorder in the central monitor network from monitor with no optional recorder, this setting is fixed at REAL TIME.

MANUAL RECORD TIME: CONTINUOUS, 10 s, 20 s, 30 s

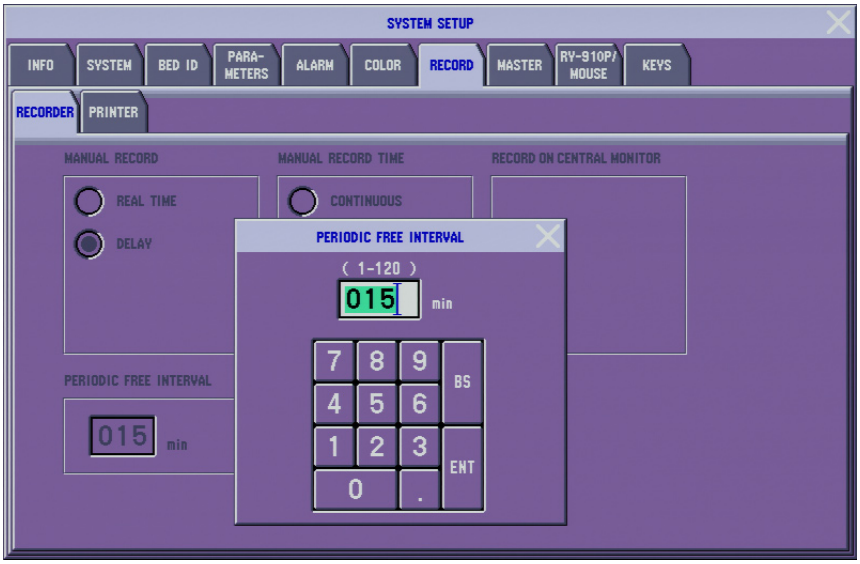
Select the length for manual recording. When CONTINUOUS is selected, the recording starts when the [⧘ record] key on the front panel is pressed and stops when the [⧘ record] key on the front panel is pressed.

When manually recording on a central monitor recorder in the central monitor network from monitor with no optional recorder, this setting is automatically changed to 30 s when CONTINUOUS is selected.

PERIODIC FREE INTERVAL: 1 to 120 min

You can select the FREE time interval from 1 to 120 min in 1 min steps for periodic recording. See “Setting Periodic Recording” in Operator’s Manual or Section 10 of the User’s Guide Part I.

1. Touch the EDIT key. The PERIODIC FREE INTERVAL window opens.



2. Enter the interval by touching the number keys on the screen.

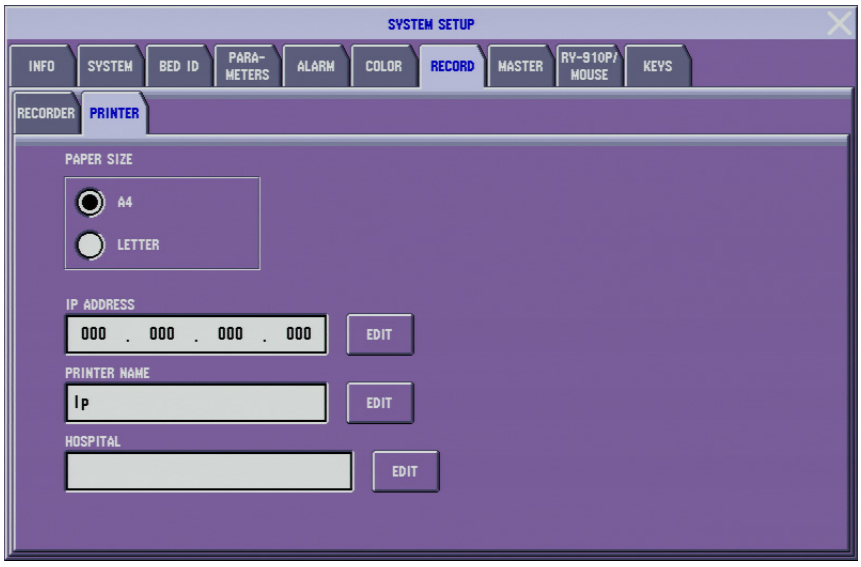
3. Touch the ENT key to register the value.

RECORD ON CENTRAL MONITOR

When the bedside monitor has no optional recorder, recording can be performed on the central monitor recorder in the central monitor network. Select the central monitor for the remote recording destination from the list of central monitors (bed IDs).

PRINTER Page

Change the settings according to the network printer.



PAPER SIZE: A4, LETTER

Select the paper size of the network printer.

IP ADDRESS

Set the IP address of the network printer.

1. Touch the EDIT key beside the <IP ADDRESS> box.

2. Use the number keys on the screen to enter the IP address of the network printer.

3. Touch the SET key to register the IP address.

PRINTER NAME

Enter the printer name. Up to 16 alphanumeric characters can be entered. Normally, use the default setting “lp”. If data cannot be printed, change the setting to the printer name specified in the printer manual. If the printing still cannot be performed, contact your Nihon Kohden representative.

1. Touch the EDIT key beside the <PRINTER NAME> box.

2. Use the alphanumeric keys on the screen to enter the printer name of the network printer.

3. Touch the SET key to register the printer name.

HOSPITAL

You can print the hospital or institution name at the top of the printing paper. Up to 32 alphanumeric characters can be entered.

1. Touch the EDIT key beside the <HOSPITAL> box.

2. Use the alphanumeric keys on the screen to enter the hospital name of the network printer.

3. Touch the SET key to register the hospital name.

Using Network Printer

Printer Settings in the Network

Data of a bedside monitor can be printed on a PostScript network printer which supports lpr protocol. The settings and network address on the printer must be set so that PostScript data of the monitor can be printed. The printer must have at least 32 MB memory. For details about the printer, refer to the printer manual or contact your Nihon Kohden representative.

For a network printer, we recommend HP LaserJet 4200N or equivalent.

Settings on the Printer

Set the network address on the printer and other settings so that PostScript data of the monitor can be printed. For the network address, when setting the network address automatically on the monitors, change the settings as shown below. When setting the network address manually on the monitors, the network address of the printer must be different from the network address of the monitors.

IP address: 010.255.255.250
Subnet mask: 255.000.000.000
Default gateway address: 000.000.000.000
Access control address*: 000.000.000.000
Access control mask*: 000.000.000.000

* HP printers do not have access control address and access control mask settings.

After changing the settings on the printer, turn the printer power off and on so that the IP address is recognized by the printer.

The HP LaserJet 4200N printer automatically recognizes PostScript, so there is no setting for PostScript on this printer. Only the network address (IP ADDRESS, SUBNET MASK and DEF. GATEWAY) needs to be set on this printer.

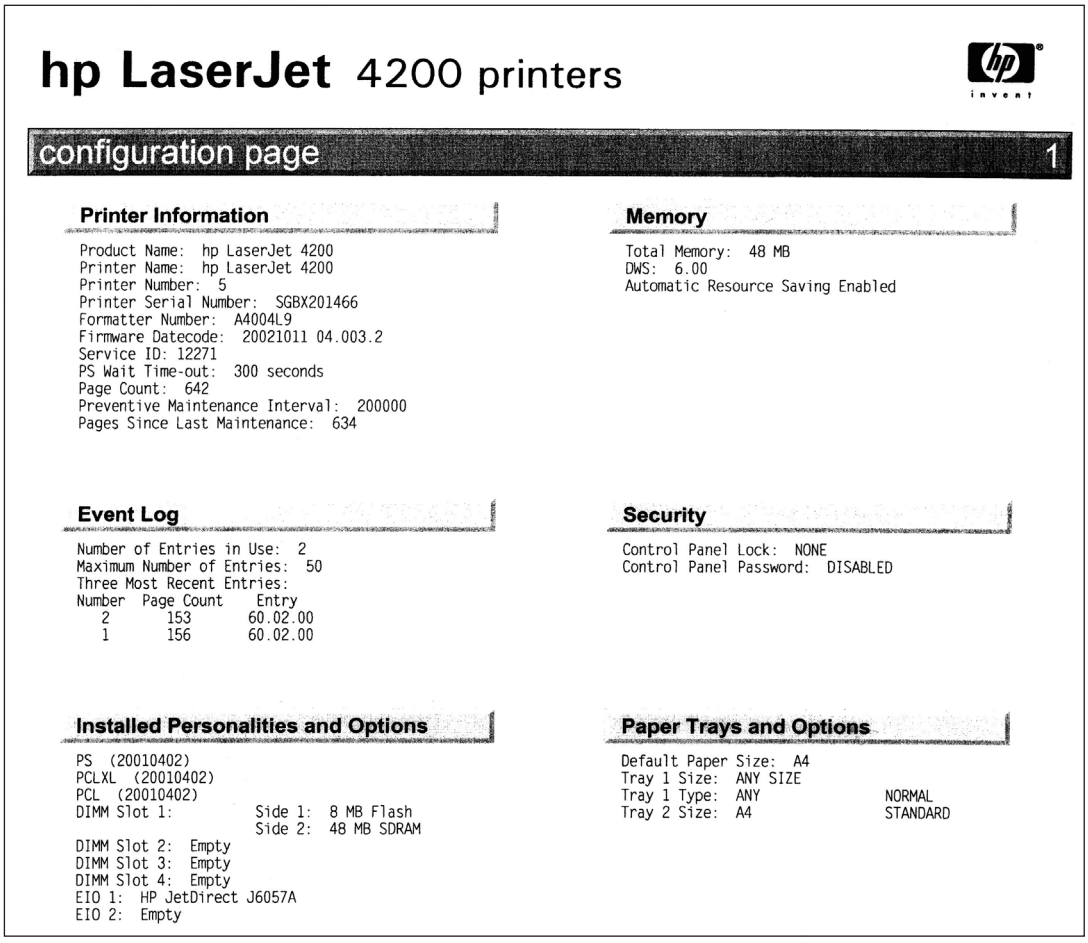
Settings on the Bedside Monitor

Set the settings on the PRINTER page of the SYSTEM SETUP window on the bedside monitor as follows.

Printer Name*: lp
IP Address: Set the printer's IP address.

* If data cannot be printed when this setting is "lp", change the setting to the printer name specified in the printer manual. If printing still cannot be performed, contact your Nihon Kohden representative.

Printer Setting Example



hp LaserJet 4200 printers

configuration page 1

Printer Information

Product Name: hp LaserJet 4200
Printer Name: hp LaserJet 4200
Printer Number: 5
Printer Serial Number: SGBX201466
Formatter Number: A4004L9
Firmware Datecode: 20021011 04.003.2
Service ID: 12271
PS Wait Time-out: 300 seconds
Page Count: 642
Preventive Maintenance Interval: 200000
Pages Since Last Maintenance: 634

Memory

Total Memory: 48 MB
DWS: 6.00
Automatic Resource Saving Enabled

Event Log

Number of Entries in Use: 2
Maximum Number of Entries: 50
Three Most Recent Entries:

Number	Page Count	Entry
2	153	60.02.00
1	156	60.02.00

Security

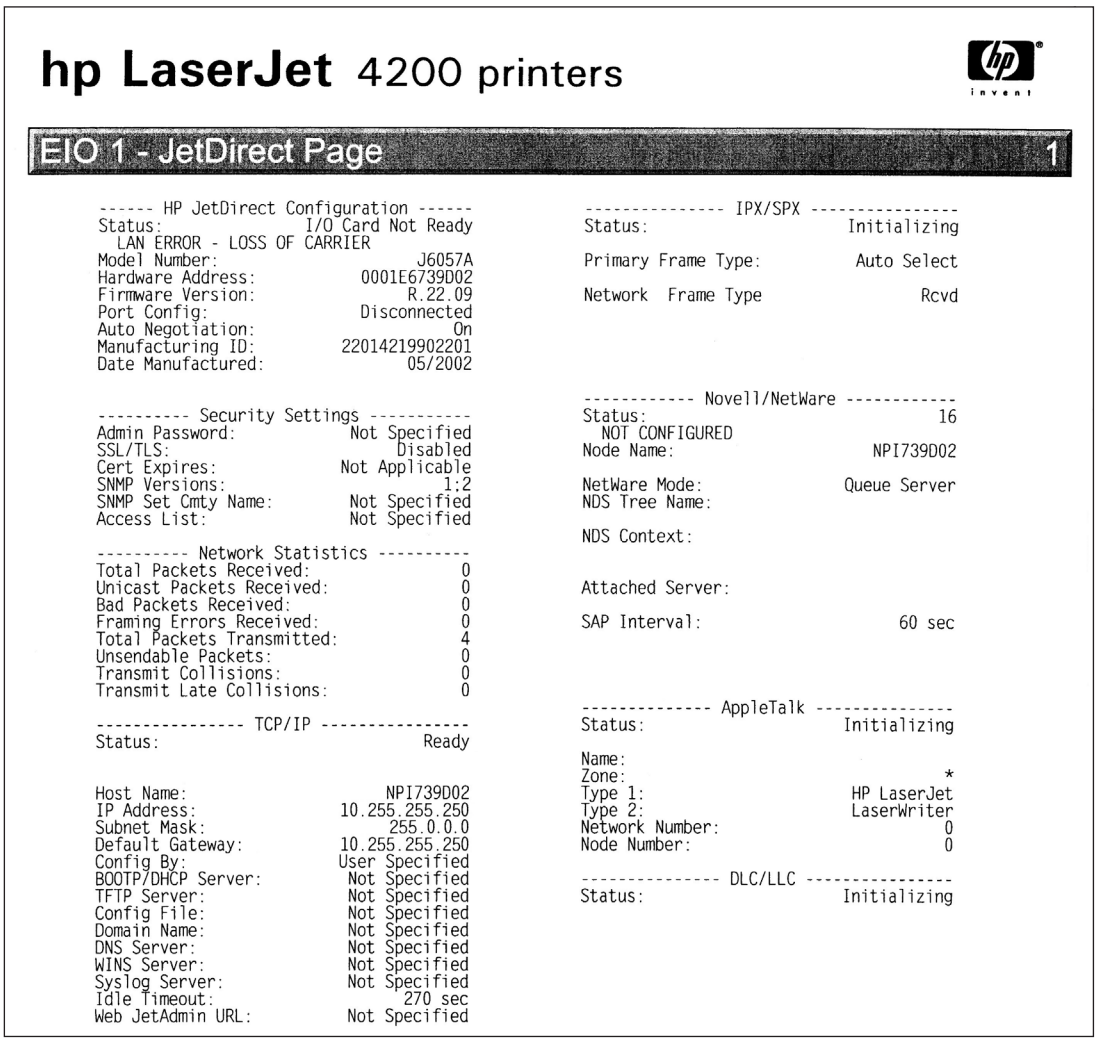
Control Panel Lock: NONE
Control Panel Password: DISABLED

Installed Personalities and Options

PS (20010402)
PCLXL (20010402)
PCL (20010402)
DIMM Slot 1: Side 1: 8 MB Flash
Side 2: 48 MB SDRAM
DIMM Slot 2: Empty
DIMM Slot 3: Empty
DIMM Slot 4: Empty
EIO 1: HP JetDirect J6057A
EIO 2: Empty

Paper Trays and Options

Default Paper Size: A4
Tray 1 Size: ANY SIZE
Tray 1 Type: ANY NORMAL
Tray 2 Size: A4 STANDARD



hp LaserJet 4200 printers

EIO 1 - JetDirect Page 1

```
------ HP JetDirect Configuration ------
Status:                 I/O Card Not Ready
  LAN ERROR - LOSS OF CARRIER
Model Number:                       J6057A
Hardware Address:             0001E6739D02
Firmware Version:                  R.22.09
Port Config:                  Disconnected
Auto Negotiation:                      On
Manufacturing ID:           22014219902201
Date Manufactured:                 05/2002


---------- Security Settings ----------
Admin Password:               Not Specified
SSL/TLS:                          Disabled
Cert Expires:                 Not Applicable
SNMP Versions:                          1:2
SNMP Set Cmty Name:           Not Specified
Access List:                  Not Specified

---------- Network Statistics ----------
Total Packets Received:                 0
Unicast Packets Received:               0
Bad Packets Received:                   0
Framing Errors Received:                0
Total Packets Transmitted:              4
Unsendable Packets:                     0
Transmit Collisions:                    0
Transmit Late Collisions:               0

---------- TCP/IP ----------
Status:                             Ready


Host Name:                       NPI739D02
IP Address:                10.255.255.250
Subnet Mask:                    255.0.0.0
Default Gateway:           10.255.255.250
Config By:                 User Specified
BOOTP/DHCP Server:            Not Specified
TFTP Server:                  Not Specified
Config File:                  Not Specified
Domain Name:                  Not Specified
DNS Server:                   Not Specified
WINS Server:                  Not Specified
Syslog Server:                Not Specified
Idle Timeout:                       270 sec
Web JetAdmin URL:             Not Specified

---------- IPX/SPX ----------
Status:                       Initializing

Primary Frame Type:            Auto Select

Network  Frame Type                   Rcvd



---------- Novell/NetWare ----------
Status:                                 16
  NOT CONFIGURED
Node Name:                       NPI739D02

NetWare Mode:                  Queue Server
NDS Tree Name:

NDS Context:


Attached Server:

SAP Interval:                       60 sec



---------- AppleTalk ----------
Status:                       Initializing

Name:
Zone:                                    *
Type 1:                         HP LaserJet
Type 2:                         LaserWriter
Network Number:                         0
Node Number:                            0

---------- DLC/LLC ----------
Status:                       Initializing
```

MASTER Window

For fast and easy alarm setup, a group of alarm items can be set all together at one time. This is called an alarm master. For example, there may be typical alarm settings at your hospital, or you may have certain alarm settings for certain patients.

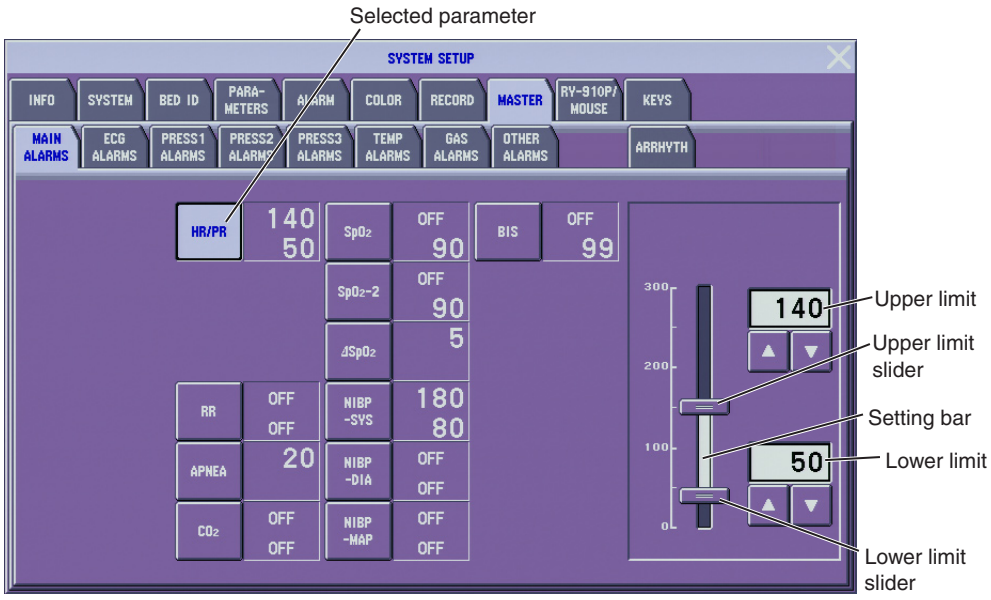
Even when alarms are set by an alarm master, individual alarm settings in the alarm master can still be changed on the ALARM LIMITS or ARRHYTH ALARM window or the alarm setting in each parameter setup window.

When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON, the alarm settings return to the master settings 30 minutes after the monitor is turned off. When <AUTO ADMIT> is set to OFF, you can select whether to save the settings or initialize the master settings.

WARNING

If more than one medical equipment is used together in the same facility, make sure all equipments have the same alarm default settings (alarm master). If the medical equipments have different alarm default settings and when initialized, the alarm settings differ with the other equipments and alarm cannot be managed appropriately in the facility. If using different alarm default settings according to areas or wings in the facility, manage the alarms appropriately.

MAIN ALARMS/ECG ALARMS/PRESS ALARMS/TEMP ALARMS/GAS ALARMS/OTHER ALARMS Pages

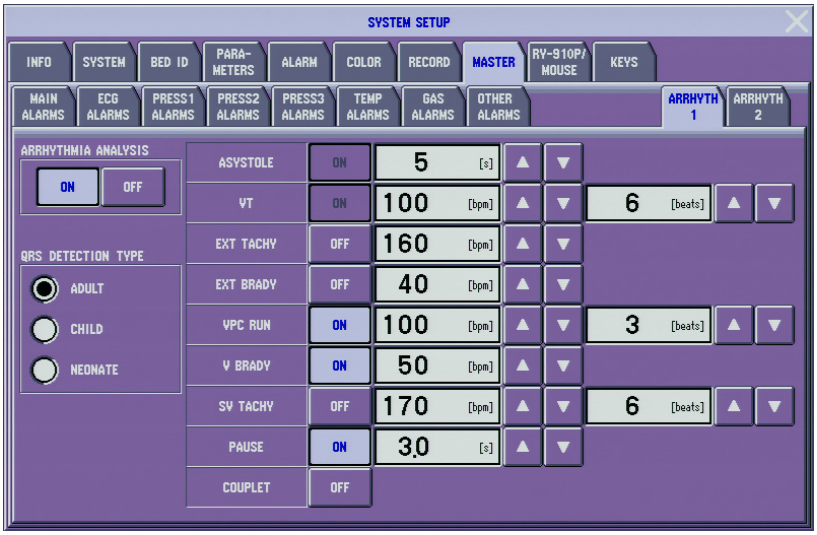


1. Select the parameter to set alarm limits. The current alarm limits appear in the setting bar area.

2. Touch and drag the sliders to the desired level on the setting bar. Use the ▲ or ▼ key to adjust the setting.

   If the upper limit is set to a value above the maximum, the upper limit alarm is set to OFF. If the lower limit is set to a value below the minimum, the lower limit alarm is set to OFF.

ARRHYTH Page



ARRHYTH page when ARRHYTHMIA TYPE is STANDARD

ARRHYTHMIA ANALYSIS

WARNING

For arrhythmia monitoring, set <ARRHYTHMIA ANALYSIS> on the SYSTEM SETUP window to ON. Otherwise, there is no sound or indication for arrhythmia alarms (except for ASYSTOLE).

Select the ARRHYTHMIA ANALYSIS master setting. The arrhythmia analysis can also be turned on or off on the ECG window but the setting changes to this master setting when the monitor is turned off for more than 30 minutes.

When the <ARRHYTHMIA ANALYSIS> is set to OFF, an “ARRHYTHMIA ANALYSIS OFF” message is displayed on the screen.

When the site setting is NICU on the SITE window of the SYSTEM CONFIGURATION screen and <ARRHYTHMIA ANALYSIS> on the SYSTEM SETUP window is set to OFF, ST level and VPC rate are not displayed on the home screen.

QRS DETECTION TYPE

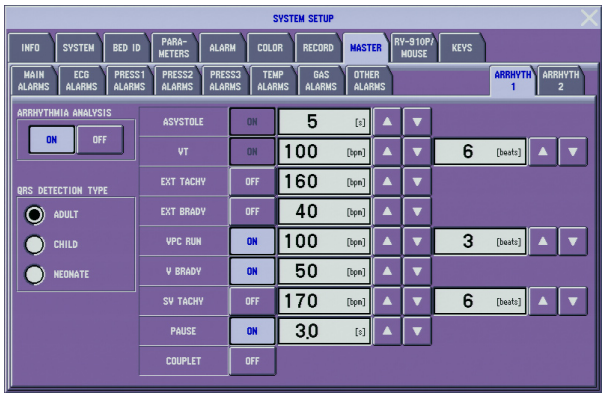
Select the QRS DETECTION TYPE master setting. When <AUTO ADMIT> in the SYSTEM CONFIGURATION screen is set to ON, the QRS detection type set on the ECG window return to the master settings 30 minutes after the monitor is turned off. When <AUTO ADMIT> is set to OFF, you can select whether to save the settings or initialize the master settings.

Arrhythmia Alarms

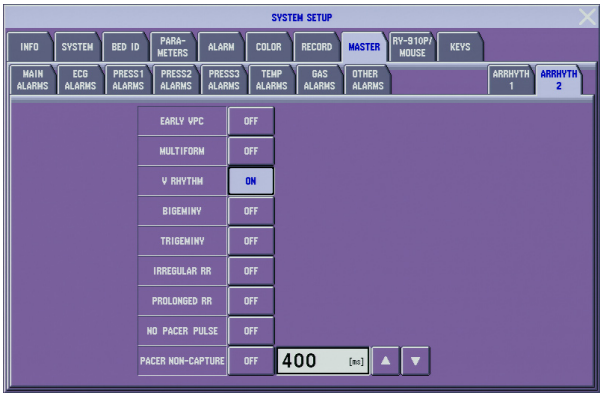
When "EXTENDED" is selected for the <ARRHYTHMIA TYPE> on the ECG page of the PARAMETERS window in the SYSTEM SETUP window, there are two pages for arrhythmia alarms master settings.

NOTE

The arrhythmia type setting is not available on the BSM-6000A series. For BSM-6000A series, arrhythmia type is STANDARD only.



ARRHYTH 1 page when ARRHYTHMIA TYPE is EXTENDED



ARRHYTH 2 page when ARRHYTHMIA TYPE is EXTENDED

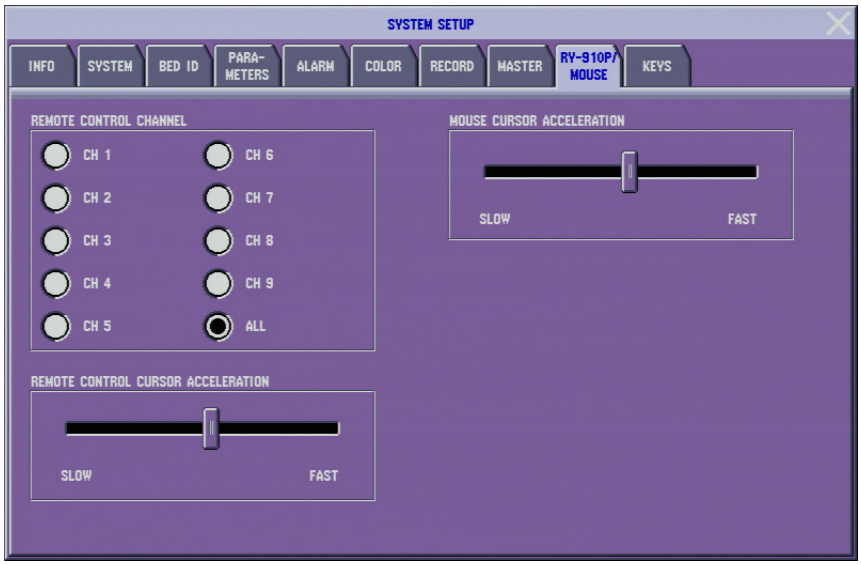
To turn each arrhythmia alarm ON/OFF

Touch the ON or OFF key for each arrhythmia type to set it on or off. ASYSTOLE, VF, VT are fixed to ON.

To set the threshold

Use the ▲ or ▼ key to change setting.

RY-910P/MOUSE Window



REMOTE CONTROL CHANNEL

CAUTION

- Set the remote control channel on the monitor to prevent the remote control from operating a different monitor.
- When several monitors are installed close together, check that the remote control operates only the desired monitor. If the remote control operates a different monitor, recheck the channel setting.

Set the channel for the remote control.

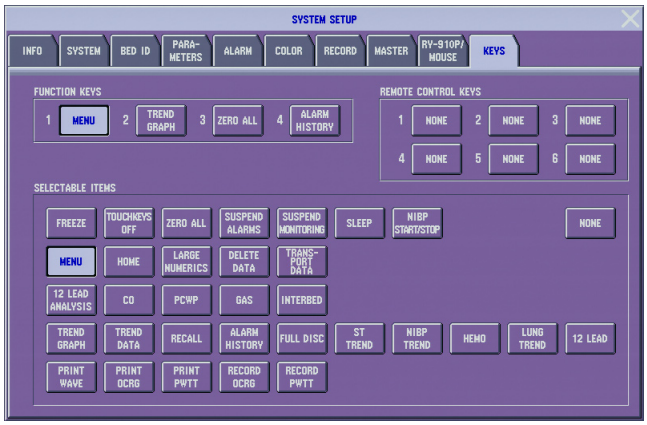
REMOTE CONTROL CURSOR ACCELERATION

Set the distance moved by the remote control cursor.

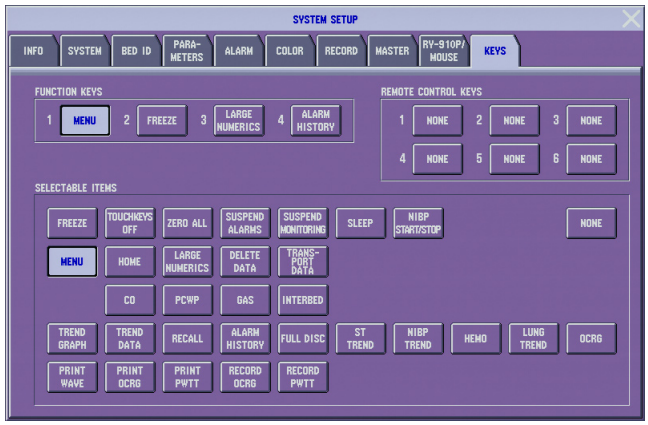
MOUSE CURSOR ACCELERATION

Set the distance moved by the mouse cursor.

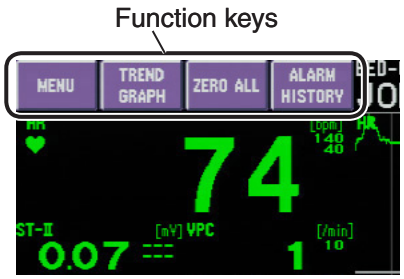
KEYS Window



KEYS window when site is OR/ICU



KEYS window when site is NICU



FUNCTION KEYS

A function or window can be assigned to each function key on the upper left corner of the screen so you can easily access frequently used windows or functions. When a function or window is assigned to a function key, that function can be performed or that window can be displayed just by touching the function key. You do not need to return to the home screen or display the MENU window.

There are four function keys on the monitor. Assign a function or window to each key from the <SELECTABLE ITEMS> box.

REMOTE CONTROL KEYS

There are six function keys on the remote control. Assign a function or window to each key from the <SELECTABLE ITEMS> box.

Section 4 Reference

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Factory Default Settings

This section shows the factory default settings of the SYSTEM CONFIGURATION screen and SYSTEM SETUP window settings. Other default settings are listed in the Operator's Manual. OK in the backup column indicates that the settings remain in memory even when the power is turned off.

NOTE

- When the settings are initialized, the site mode is changed to ICU and all settings are changed to the factory default settings for the ICU mode.
- The settings on the NETWORK window of the SYSTEM CONFIGURATION screen do not change to the default settings when initialized.
- Changing the site mode does not initialize the settings.
- Changing the site mode changes the settings to the settings of the new mode. e.g. When the site mode is changed from ICU to NICU, HR/PR upper limit setting on the MAIN ALARMS page of the MASTER window changes from 140 to 180 beats/min.

SYSTEM CONFIGURATION Screen

Window	Setting Items	Setting Range	Default Setting	Backup
SITE		OR, ICU, NICU	ICU	OK
NETWORK	GROUP	General, CCU, CCU-1, CCU-2, ER, ICU, ICU-1, ICU-2, OR, PostCCU, Recovery, Tele-1, Tele-2, Tele-3 Tele-4, Tele-5	General	OK
	IP ADDRESS SETUP	AUTO, MANUAL	AUTO	
UNITS	HEIGHT	cm, inch	cm	OK
	WEIGHT	kg, pound	kg	
	ST	mV, mm	mV	
	TEMPERATURE	°C, °F	°C	
	HEMOGLOBIN	g/dL, mmol/L	g/dL	
	BLOOD PRESSURE	mmHg/cmH_2O, kPa/hPa	mmHg/cmH_2O	
	CO_2*	mmHg, kPa	mmHg	
	RESPIRATION*	cmH_2O, kPa	cmH_2O	
	$tcPO_2/PCO_2$	mmHg, kPa	mmHg	
TRANSPORT	DATA TRANSPORT USING INPUT UNIT	ENABLE, DISABLE	DISABLE	OK
	USE SETTINGS IN INPUT UNIT	On, Off	On	
	TIME ZONE	0 to ±12:00 in 30 minute steps	+9:00	
	AUTO ADMIT	On, Off	On	
PC	BAUD RATE	9600, 19200, 38400	9600	OK
	PARITY	NONE, EVEN, ODD	NONE	
	WORD LENGTH	7 bits, 8 bits	8 bits	
	STOP BIT	1, 2	1	
CHANGE PASSWORD		4 numbers	1234	OK
OTHER	ZS-900P TYPE	TYPE 8, TYPE A	TYPE A	OK
	TIME ZONE	0 to ±12:00 in 30 minute steps	+9:00	
	SIMULATION MODE	On, Off	Off	

* Not available for BSM-6000A series.

SYSTEM SETUP Window

Window	Page	Setting Items	Setting Range	Default Setting	Backup
SYSTEM	DISPLAY	WAVE DISPLAY	MOVING, FIXED	MOVING	OK
		DISPLAY COLOR MODE	PARAMETER, ALARM	PARAMETER	
		SUB DISPLAY	SLAVE, HOME SCREEN	SLAVE	
		CURRENT TREND	NORMAL, PWTT, OCRG cm/min, OCRG 3 cm/min, OFF	NORMAL	
		POWER SAVING MODE	On, Off	On	
		FILL IN CO_2 WAVEFORM	On, Off	Off	
	LAYOUT	NUMERIC PARAMETER AREA	LEFT SIDE, SIDE + SMALL BOTTOM, SIDE + LARGE BOTTOM	LEFT SIDE	OK
		LARGE NUMERIC SCREEN LAYOUT	2 × 2, 3 × 4	2 × 2	
	VOLUME	ALARM MINIMUM VOLUME	7 levels	1	OK
		NIBP COMPLETION	7 levels	2	
		KEY CLICK	7 levels	2	
		INTERBED ALARM	7 levels	2	
BED ID			Up to 10 alphanumerics	OR: OR-001 ICU: ICU-001 NICU: NICU-001	OK
PARAMETERS	ECG	ECG ELECTRODES	IEC, AHA	IEC	OK
		SYNC SOUND PITCH	HIGH, MIDDLE, LOW	HIGH	
		ARRHYTHMIA TYPE*1	STANDARD, EXTENDED	STANDARD	
		HUM FILTER	50 Hz, 60 Hz	50 Hz	
		PACING MARK POSITION	ABOVE WAVE, OVERLAP WAVE	ABOVE WAVE	
		ALARM INDICATOR QRS SYNC	On, Off	OR, NICU: Off ICU: On	
		ST MEASUREMENT*2	On, Off	Off	
	NIBP	COMPLETION SOUND	On, Off	OR: On ICU, NICU: Off	OK
		SIM	On, Off	OR: On	
		NIBP INTERVAL KEY STARTS NIBP	On, Off	Off	
		INTERVAL MASTER	MANUAL, STAT, SIM, 1 min, 2 min, 2.5 min, 5 min, 10 min, 15 min, 30 min, 1 h, 2 h, 4 h, 8 h	MANUAL	
		OLD DATA DISPLAY	DIM, HIDE	DIM	
		TIME UNTIL DATA IS OLD	10 min, 30 min, 1 h, 24 h	OR: 10 min ICU, NICU: 30 min	

*1 Not available for BSM-6000A series.

*2 Available only when site is NICU.

Window	Page		Setting Items	Setting Range	Default Setting	Backup
PARAMETERS	NIBP MODE	STAT	STAGE 1 INTERVAL	STAT, 1 min	STAT	OK
			STAGE 1 OPERATING TIME	5 min, 10 min	5 min	
			STAGE 2 INTERVAL	MANUAL, 1 min, 2 min, 2.5 min, 5 min, 10 min, 15 min, 30 min	OR: 5 min ICU, NICU: MANUAL	
		SIM (OR site only)	STAGE 1 INTERVAL	1 min, 2 min, 2.5 min	2 min	OK
			STAGE 1 OPERATING TIME	5 min, 10 min, 15 min	15 min	
			STAGE 2 INTERVAL	2 min, 2.5 min, 5 min	5 min	
		INTERVAL	NIBP INTERVALS	OFF, MANUAL, STAT, SIM, 1 min, 2 min, 2.5 min, 5 min, 10 min, 15 min, 30 min, 1 h, 2 h, 4 h, 8 h	OR: OFF, MANUAL, STAT, 2 min, 2.5 min, 5 min, 10 min ICU: OFF, MANUAL, 5 min, 10 min, 30 min, 1 h NICU: OFF, MANUAL, 30 min, 1 h	OK
		VENOUS PUNCTURE	VENOUS PUNCTURE	On, Off	Off	OK
			TARGET CUFF PRESSURE	ADULT: 20 to 120 mmHg CHILD: 20 to 80 mmHg NEONATE: 20 to 50 mmHg	ADULT: 70 mmHg CHILD: 50 mmHg NEONATE: 40 mmHg	
		INITIAL CUFF PRESS	INITIAL CUFF PRESSURE	ADULT: 100 to 280 mmHg CHILD: 100 to 280 mmHg NEONATE: 70 to 120 mmHg	ADULT: 180 mmHg CHILD: 140 mmHg NEONATE: 100 mmHg	OK
	CO_2		GAS COMPOSITION	CO_2: 4.00 to 6.00% (0.01 step)	5.00	OK
	GAS	MAINTENANCE	GAS COMPOSITION	CO_2: 1.50 to 57.00% (0.01 step) O_2: 0 to 55.50% (0.01 step) N_2O: 1.50 to 92% (0.01 step) Agent: 1.50 to 18.50% (0.01 step)	CO_2: 5.00 O_2: 52.00 N_2O: 40.00 HAL: 3.00	OK
			CALIBRATION GAS	HAL, ISO, ENF, SEV, DES	ISO	
		SETTINGS	AGENT HOLD TIME	10 to 60 min	60	OK
			MAX Ttot	20 to 40 s	30	
			TEMPERATURE AND HUMIDITY COMPENSATION	ATPD, STPD, BTPS	ATPD	
			MAC*	UNCORRECTED, AMBIENT PRESSURE CORRECTED, ENHANCED	UNCORRECTED	
	FLOW/ Paw*	SETTINGS	GAS SAMPLING CORRECTION	AUTO, OFF	AUTO	OK

* Not available for BSM-6000A series.

Window	Page		Setting Items	Setting Range	Default Setting	Backup
PARAMETERS	EEG*1		AUTO IMPEDANCE CHECK	ON, OFF	ON	OK
			BAND SETTINGS	0.0 to 60.0 Hz	1.0 < DELTA < 4.0 < THETA < 8.0 < ALPHA < 13.0 < BETA < 30.0 < GAMMA <50.0	
	OTHER PARAM		PRESS FILTER	12 Hz, 20 Hz	12 Hz	OK
			IBP ANALOG OUT	FIXED POSITION, HIGHEST PRIORITY LABEL	HIGHEST PRIORITY LABEL	
			NOISE REDUCTION ON IMPEDANCE RESP	On, Off	On	
ALARM	SILENCE/ SUSPEND		SILENCE ALARMS TIME	1 min, 2 min, 3 min	2 min	OK
			ALARM ACTIVATION DELAY	AUTO, 1 min, 2 min, 3 min	2 min	
			SILENCE SpO_2 ALARM*2	On, Off	Off	
			ALARM INACTIVATION	SUSPEND ALARMS, ALL ALARMS OFF	ICU, NICU: SUSPEND ALARMS OR: ALL ALARMS OFF	
				SUSPEND ALARMS TIME: 1 min, 2 min, 3 min	OR: – ICU, NICU: 2 min	
				ALARMS OFF TYPE: BYPASS, ALL ALARMS OFF	OR: BYPASS ICU, NICU: –	
				REMINDER*3: On, Off	Off	
				ALARM INDICATOR LIT: On, Off	ICU, NICU: ON OR: OFF	
	DISPLAY/SOUND		LIMIT DISPLAY	MARK BRIGHT, MARK DIM, VALUES	VALUES	OK
			ALARM SOUND TYPE	NK1, NK2, IEC	NK1	
			ALARM PRIORITY COLOR	• CRISIS: red, WARNING: yellow, ADVISORY: cyan • CRISIS: red, WARNING: orange, ADVISORY: yellow	CRISIS: red, WARNING: yellow, ADVISORY: cyan	
			ADVISORY ALARM SOUND INTERVAL	20 s, 120 s	20 s	
	ALARM PRIORITY	PARAMETER 1	HR/PR UPPER	CRISIS, WARNING, ADVISORY	WARNING	OK
			HR/PR LOWER	CRISIS, WARNING, ADVISORY	OR, ICU: WARNING NICU: CRISIS	
			VPC	CRISIS, WARNING, ADVISORY	ADVISORY	
			ST	CRISIS, WARNING, ADVISORY	WARNING	
			RR	CRISIS, WARNING, ADVISORY	WARNING	
			APNEA	CRISIS, WARNING, ADVISORY	OR, ICU: WARNING NICU: CRISIS	

*1 Not available for BSM-6000A series.

*2 Not available for BSM-6000K series.

*3 Available only when ALARMS OFF TYPE is set to “ALL ALARMS OFF”.

Window	Page		Setting Items	Setting Range	Default Setting	Backup
ALARM	ALARM PRIORITY	PARAMETER 2	SpO_2 UPPER	CRISIS, WARNING, ADVISORY	WARNING	OK
			SpO_2 LOWER	CRISIS, WARNING	OR, ICU: WARNING NICU: CRISIS	
			ΔSpO_2	CRISIS, WARNING, ADVISORY	WARNING	
			NIBP	CRISIS, WARNING, ADVISORY	WARNING	
			PRESS	CRISIS, WARNING, ADVISORY	WARNING	
			TEMP	CRISIS, WARNING, ADVISORY	ADVISORY	
			CO_2(E)	CRISIS, WARNING	WARNING	
			CO_2(I)	CRISIS, WARNING	WARNING	
			O_2(E)	CRISIS, WARNING, ADVISORY	ADVISORY	
			O_2(I)	CRISIS, WARNING	WARNING	
			N_2O(E)	CRISIS, WARNING, ADVISORY	ADVISORY	
			N_2O(I)	CRISIS, WARNING	WARNING	
			AGENT(E)	CRISIS, WARNING, ADVISORY	ADVISORY	
			AGENT(I)	CRISIS, WARNING	WARNING	
			BIS	CRISIS, WARNING, ADVISORY	WARNING	
			EXTERNAL	CRISIS, WARNING, ADVISORY	ADVISORY	
			MV*1	CRISIS, WARNING, ADVISORY	ADVISORY	
			Ppeak*1	CRISIS, WARNING, ADVISORY	ADVISORY	
			PEEP*1	CRISIS, WARNING, ADVISORY	ADVISORY	
			SEF*1	CRISIS, WARNING, ADVISORY	ADVISORY	
			TP*1	CRISIS, WARNING, ADVISORY	ADVISORY	
	ARRHYTH PRIORITY		ASYSTOLE	CRISIS fixed	CRISIS	OK
			VF	CRISIS fixed	CRISIS	
			VT	CRISIS fixed	CRISIS	
			EXT TACHY*2	CRISIS, WARNING, ADVISORY	CRISIS	
			EXT BRADY*2	CRISIS, WARNING, ADVISORY	CRISIS	
			VPC RUN	CRISIS, WARNING, ADVISORY	WARNING	
			V BRADY*2	CRISIS, WARNING, ADVISORY	WARNING	
			SV TACHY*2	CRISIS, WARNING, ADVISORY	WARNING	
			PAUSE*2	CRISIS, WARNING, ADVISORY	WARNING	
			COUPLET	CRISIS, WARNING, ADVISORY	ADVISORY	
			EARLY VPC	CRISIS, WARNING, ADVISORY	ADVISORY	
			MULTIFORM*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			V RHYTHM*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			BIGEMINY	CRISIS, WARNING, ADVISORY	ADVISORY	
			TRIGEMINY*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			IRREGULAR RR*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			PROLONGED RR*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			NO PACER PULSE*2	CRISIS, WARNING, ADVISORY	ADVISORY	
			PACER NON-CAPTURE*2	CRISIS, WARNING, ADVISORY	ADVISORY	

*1 Not available for BSM-6000A series.

*2 Available only when ARRHYTHMIA TYPE on the ECG page of the SYSTEM SETUP window is set to “EXTENDED”. These setting items are not available on the BSM-6000A series.

Window	Page	Setting Items	Setting Range	Default Setting	Backup
ALARM	TECHNICAL PRIORITY	ECG CHECK ELECTRODE	WARNING, ADVISORY	ADVISORY	OK
		CANNOT ANALYZE	WARNING, ADVISORY	WARNING	
		SpO_2 CHECK PROBE	WARNING, ADVISORY	ADVISORY	
	SLEEP	EXIT SLEEP MODE ON CRISIS ALARM	On, Off	On	OK
		EXIT SLEEP MODE AT	00:00 to 23:59	06:00	
COLOR	BASIC PARAM	ECG	Green, cyan, salmon, sky blue, yellow, light yellow, white, pink, yellow green, purple, red, orange	green	OK
		RESP/CO_2		white	
		SpO_2		cyan	
		SpO_2-2		yellow	
		NIBP		pink	
		BIS		orange	
		CO		white	
	PRESS	P1 to P7, ART, ART2, RAD, DORS, AO, FEM, UA, LVP	Green, cyan, salmon, sky blue, yellow, light yellow, white, pink, yellow green, purple, red, orange	red	OK
		UV, CVP, RAP		sky blue	
		PAP, RVP, LAP		yellow	
		ICP to ICP4		light yellow	
		PPV/SPV		yellow green	
	TEMP	T1, T3, Tskin to Tskin3, Tb	Green, cyan, salmon, sky blue, yellow, light yellow, white, pink, yellow green, purple, red, orange	orange	OK
		T2, T4, Trect, Tcore, Tnaso, Teso, Ttymp, Tart, Tven, Tblad, Taxil, Tb, ΔT, ΔT2		light yellow	
	GAS	RESP/CO_2	Green, cyan, salmon, sky blue, yellow, light yellow, white, pink, yellow green, purple, red, orange	white	OK
		O_2		green	
		N_2O		sky blue	
		HAL		red	
		ISO		purple	
		ENF		orange	
		SEV		yellow	
		DES		cyan	
		MAC		orange	
	OTHER PARAM	VENT	Green, cyan, salmon, sky blue, yellow, light yellow, white, pink, yellow green, purple, red, orange	white	OK
		CCO		white	
		Tb		orange	
		$S\bar{v}O_2$		purple	
		AP		orange	
		FLOW/Paw*		white	
		EEG*		yellow green	
	ALARM	ALARM MODE COLOR	Green, salmon, sky blue, light yellow, white, pink, yellow green, purple	green	OK

* Not available for BSM-6000A series.

Window	Page	Setting Items	Setting Range	Default Setting	Backup
RECORD	RECORDER	MANUAL RECORD	REAL TIME, DELAY	DELAY	OK
		MANUAL RECORD TIME	CONTINUOUS, 10 s, 20 s, 30 s	10 s	
		PERIODIC FREE INTERVAL	1 to 120 min	15 min	
		RECORD ON CENTRAL MONITOR	—	—	
	PRINTER	PAPER SIZE	A4, LETTER	A4	OK
		IP ADDRESS	0 to 255. 0 to 255. 0 to 255. 0 to 255.	0.0.0.0	
		PRINTER NAME	—	lp	
		HOSPITAL	—	—	

Window	Page	Setting Items	Setting Range		Step	Default Setting	Backup
MASTER	MAIN ALARMS	HR/PR	Upper	OFF, 16 to 300 beats/min	1	OR, ICU: 140 beats/min NICU: 200 beats/min	OK
			Lower	OFF, 15 to 299 beats/min		OR, ICU: 50 beats/min NICU: 100 beats/min	
		RR	Upper	OFF, 2 to 150 counts/min	2	OFF	OK
			Lower	OFF, 0 to 148 counts/min			
		APNEA	Upper	OFF, 5 to 40 s	5	20 s	OK
		CO_2	Upper	OFF, 2 to 99 mmHg	1	OFF	OK
				OFF, 1.0 to 13.5 kPa	0.5		
			Lower	OFF, 1 to 98 mmHg	1	OFF	
				OFF, 0.5 to 13.0 kPa	0.5		
		SpO_2	Upper	OFF, 51 to 100%SpO_2	1	OR, ICU: OFF NICU: 95%SpO_2	OK
			Lower	OFF, 50 to 99%SpO_2		OR, ICU: 90%SpO_2 NICU: 85%SpO_2	
		SpO_2-2	Upper	OFF, 51 to 100%SpO_2	1	OR, ICU: OFF NICU: 95%SpO_2	OK
			Lower	OFF, 50 to 99%SpO_2		OR, ICU: 90%SpO_2 NICU: 85%SpO_2	
		ΔSpO_2	Upper	OFF, 1 to 50%SpO_2	1	5%SpO_2	OK
		BIS	Upper	OFF, 1 to 100	1	OFF	OK
			Lower	OFF, 0 to 99		40	
		NIBP-SYS	Upper	OFF, 15 to 260 mmHg	5	OR, ICU: 180 mmHg NICU: 100 mmHg	OK
				OFF, 1.5 to 35.0 kPa	0.5	OR, ICU: 24.0 kPa NICU: 13.5 kPa	
			Lower	OFF, 10 to 255 mmHg	5	OR, ICU: 80 mmHg NICU: 50 mmHg	
				OFF, 1.0 to 34.5 kPa	0.5	OR, ICU: 10.5 kPa NICU: 6.5 kPa	
		NIBP-DIA	Upper	OFF, 15 to 260 mmHg	5	OFF	OK
				OFF, 1.5 to 35.0 kPa	0.5		
			Lower	OFF, 10 to 255 mmHg	5	OFF	
				OFF, 1.0 to 34.5 kPa	0.5		
		NIBP-MAP	Upper	OFF, 15 to 260 mmHg	5	OFF	OK
				OFF, 1.5 to 35.0 kPa	0.5		
			Lower	OFF, 10 to 255 mmHg	5	OFF	
				OFF, 1.0 to 34.5 kPa	0.5		
	ECG ALARMS	HR/PR	Upper	OFF, 16 to 300 beats/min	1	OR, ICU: 140 beats/min NICU: 200 beats/min	OK
			Lower	OFF, 15 to 299 beats/min		OR, ICU: 50 beats/min NICU: 100 beats/min	
		VPC	Upper	OFF, 1 to 99 beats/min	1	OFF	OK

Window	Page	Setting Items	Setting Range		Step	Default Setting	Backup
MASTER	ECG ALARMS	ST-I to ST-V6	Upper	OFF, –1.99 to 2.00 mV	0.01	OFF	OK
				OFF, –19.9 to 20.0 mm	0.1		
			Lower	OFF, –2.00 to 1.99 mV	0.01	OFF	
				OFF, –20.0 to 19.9 mm	0.1		
	PRESS1 ALARMS	P1-SYS to P7-SYS	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		P1-DIA to P7-DIA	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		P1-MEAN to P7-MEAN	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
	PRESS2 ALARMS	ART-SYS, ART2-SYS, RAD-SYS, DORS-SYS, AO-SYS, FEM-SYS	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OR, ICU: 80 mmHg NICU: 50 mmHg	
				OFF, 0.0 to 39.5 kPa	0.5	OR, ICU: 10.5 kPa NICU: 6.5 kPa	
		ART-DIA, ART2-DIA, RAD-DIA, DORS-DIA, AO-DIA, FEM-DIA	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		ART-MEAN, ART2-MEAN, RAD-MEAN, DORS-MEAN, AO-MEAN, FEM-MEAN	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OR, ICU: 60 mmHg NICU: 30 mmHg	
				OFF, 0.0 to 39.5 kPa	0.5	OR, ICU: 8.0 kPa NICU: 4.0 kPa	
		UA-SYS	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		UA-DIA	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		UA-MEAN, UV-MEAN	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
	PRESS3 ALARMS	PAP-SYS, RVP-SYS, LVP-SYS	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		

Window	Page	Setting Items	Setting Range		Step	Default Setting	Backup
MASTER	PRESS3 ALARMS	PAP-DIA, RVP-DIA, LVP-DIA	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
		PAP-MEAN, CVP-MEAN, RAP-MEAN, RVP-MEAN, LAP-MEAN, LVP-MEAN, ICP-MEAN, ICP2-MEAN to ICP4-MEAN	Upper	OFF, 2 to 300 mmHg	2	OFF	OK
				OFF, 0.5 to 40.0 kPa	0.5		
			Lower	OFF, 0 to 298 mmHg	2	OFF	
				OFF, 0.0 to 39.5 kPa	0.5		
	TEMP ALARMS	T1 to T4, Tskin, Tskin2, Tskin3, Trect, Tcore, Tnaso, Teso, Ttymp	Upper	OFF, 0.1 to 45.0°C	0.1	OR, ICU: 38.0°C NICU: 39.0°C	OK
				OFF, 33.0 to 113.0°F	1.0	OR, ICU: 100°F NICU: 102°F	
			Lower	OFF, 0.0 to 44.9°C	0.1	OFF	
				OFF, 32.0 to 112.0°F	1.0		
		Tblad, Taxil	Upper	OFF, 0.1 to 45.0°C	0.1	OR, ICU: 38.0°C NICU: 39.0°C	OK
				OFF, 33.0 to 113.0°F	1.0	OR, ICU: 100°F NICU: 102°F	
			Lower	OFF, 0.0 to 44.9°C	0.1	OFF	
				OFF, 32.0 to 112.0°F	1.0		
		Tb	Upper	OFF, 15.1 to 45.0°C	0.1	OR, ICU: 38.0°C NICU: 39.0°C	OK
				OFF, 51.0 to 113.0°F	1.0	OR, ICU: 100°F NICU: 102°F	
			Lower	OFF, 15.0 to 44.9°C	0.1	OFF	
				OFF, 50.0 to 112.0°F	1.0		
		ΔT, ΔT2	Upper	OFF, 0.1 to 45.0°C	0.1	OFF	OK
				OFF, 1.0 to 113.0°F	1.0		
	GAS ALARMS	RR	Upper	OFF, 2 to 150 counts/min	2	OFF	OK
			Lower	OFF, 0 to 148 counts/min		OFF	
		APNEA	Upper	OFF, 5 to 40 s	5	20 s	OK
			Lower	–	–	–	
		CO_2(E)	Upper	OFF, 2 to 99 mmHg	1	OFF	OK
				OFF, 1.0 to 13.5 kPa	0.5		
			Lower	OFF, 1 to 98 mmHg	1	OFF	
				OFF, 0.5 to 13.0 kPa	0.5		
		CO_2(I)	Upper	OFF, 1 to 5 mmHg	1	OR: **3 mmHg** ICU, NICU: OFF	OK
				OFF, 0.1 to 0.7 kPa	0.1	OR: 0.4 kPa ICU, NICU: OFF	
		O_2(E)	Upper	OFF, 11 to 100%	1	OFF	OK
			Lower	OFF, 10 to 99%		OFF	
		O_2(I)	Upper	OFF, 19 to 100%	1	OFF	OK
			Lower	18 to 99%		18%	
		N_2O(E)	Upper	OFF, 1 to 100%	1	OFF	OK
			Lower	OFF, 0 to 99%		OFF	
		N_2O(I)	Upper	OFF, 1 to 100%	1	80%	OK
			Lower	OFF, 0 to 99%		OFF	

Window	Page	Setting Items	Setting Range		Step	Default Setting	Backup
MASTER	GAS ALARMS	HAL(E)	Upper	OFF, 0.1 to 7.0%	0.1	OFF	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		HAL(I)	Upper	OFF, 0.1 to 7.0%	0.1	4.0%	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		ISO(E)	Upper	OFF, 0.1 to 7.0%	0.1	OFF	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		ISO(I)	Upper	OFF, 0.1 to 7.0%	0.1	5.0%	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		ENF(E)	Upper	OFF, 0.1 to 7.0%	0.1	OFF	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		ENF(I)	Upper	OFF, 0.1 to 7.0%	0.1	5.0%	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		SEV(E)	Upper	OFF, 0.1 to 7.0%	0.1	OFF	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		SEV(I)	Upper	OFF, 0.1 to 7.0%	0.1	6.0%	OK
			Lower	OFF, 0.0 to 6.9%		OFF	
		DES(E)	Upper	OFF, 0.1 to 20.0%	0.1	OFF	OK
			Lower	OFF, 0.0 to 19.9%		OFF	
		DES(I)	Upper	OFF, 0.1 to 20.0%	0.1	12.0%	OK
			Lower	OFF, 0.0 to 19.9%		OFF	
	OTHER ALARMS	MV*	Upper	OFF, 0.1 to 30.0 L/min	0.1	OR, ICU: 10.0 NICU: OFF	OK
			Lower	OFF, 0.0 to 29.9 L/min		OR, ICU: 2.0 NICU: OFF	
		Ppeak*	Upper	OFF, 1 to 100 cmH_2O	1	OR, ICU: 40 NICU: OFF	OK
			Lower	OFF, 0 to 99 cmH_2O		OR, ICU: OFF NICU: OFF	
		PEEP*	Upper	OFF, 1 to 50 cmH_2O	1	OR, ICU: 10 NICU: OFF	OK
			Lower	OFF, 0 to 49 cmH_2O		OR, ICU: OFF NICU: OFF	
		SEF*	Upper	OFF, 1.0 to 60.0 Hz	0.5	OFF	OK
			Lower	OFF, 0.5 to 59.5 Hz		OFF	
		TP*	Upper	OFF, 0.02 to 9.99 nW	0.01	OFF	OK
			Lower	OFF, 0.01 to 9.98 nW		OFF	

* Not available for BSM-6000A series.

Window	Page	Setting Items	Setting Range	Step	Default Setting	Backup
MASTER	ARRHYTH	ARRHYTHMIA ANALYSIS	ON, OFF	–	ON	OK
		QRS DETECTION TYPE	ADULT, CHILD, NEONATE	–	OR, ICU: ADULT NICU: NEONATE	OK
		ASYSTOLE	ON fixed 3 to 10 s	1	OR, ICU: 5 s NICU: 3 s	OK
		VF	ON fixed	–	ON	OK
		VT	ON fixed	–	ON	OK
		EXT TACHY*	ON, OFF	–	OFF	OK
			upper heart rate alarm limit to 300	1	OR, ICU: 160 bpm NICU: 220 bpm	
		EXT BRADY*	ON, OFF	–	OFF	OK
			15 to lower heart rate alarm limit	1	OR, ICU: 40 bpm NICU: 80 bpm	
		VPC RUN	ON, OFF	–	OR, NICU: OFF ICU: ON	OK
			16 to 300 bpm	1	OR, ICU: 100 bpm NICU: 140 bpm	
			3 to 8 beats	1	3 beats	
		V BRADY*	ON, OFF	–	OR, NICU: OFF ICU: ON	OK
			15 to 299 bpm	1	OR, ICU: 50 bpm NICU: 60 bpm	
		SV TACHY*	ON, OFF	–	OFF	OK
			16 to 300 bpm	1	OR, ICU: 170 bpm NICU: 210 bpm	
			3 to 9 beats	1	6 beats	
		PAUSE*	ON, OFF	–	ON	OK
			1.0 to 3.0 s	0.1	OR, ICU: 3.0 s NICU: 1.5 s	
		COUPLET	ON, OFF	–	OFF	OK
		EARLY VPC	ON, OFF	–	OFF	OK
		MULTIFORM*	ON, OFF	–	OFF	OK
		V RHYTHM*	ON, OFF	–	OR, NICU: OFF ICU: ON	OK
		BIGEMINY	ON, OFF	–	OFF	OK
		TRGEMINY*	ON, OFF	–	OFF	OK
		IRREGULAR RR*	ON, OFF	–	OFF	OK
		PROLONGED RR*	ON, OFF	–	OFF	OK
		NO PACER PULSE*	ON, OFF	–	OFF	OK
		PACER NON-CAPTURE*	ON, OFF	–	OFF	OK
			40 to 480 ms	4	400 ms	

* Available only when ARRHYTHMIA TYPE on the ECG page of the SYSTEM SETUP window is set to “EXTENDED”. These setting items are not available on the BSM-6000A series.

Window	Page	Setting Items	Setting Range	Default Setting	Backup
RY-910P/MOUSE		REMOTE CONTROL CURSOR ACCELERATION	SLOW to FAST	medium	OK
		MOUSE CURSOR ACCELERATION			
KEYS		FUNCTION KEYS	FREEZE, TOUCHKEYS OFF, ZERO ALL, SUSPEND ALARMS, SUSPEND MONITORING*1, SLEEP*2, BYPASS*3, NIBP START/STOP, MENU, HOME, LARGE NUMERICS, DELETE DATA (BSM-6000K series only), NEXT CASE (BSM-6000A series only)*4, TRANSPORT DATA (BSM-6000K series only)*5, X-PORT DATA (BSM-6000A series only)*5, 12 LEAD ANALYSIS*6 CO, PCWP, GAS, INTERBED, TREND GRAPH, TREND DATA, RECALL, ALARM HISTORY, FULL DISC, ST TREND*7, NIBP TREND, HEMO, LUNG TREND, OCRG*8, 12 LEAD*6, PRINT WAVE, PRINT OCRG, PRINT PWTT, RECORD OCRG, RECORD PWTT, NONE	1: MENU 2: TREND GRAPH 3: ZERO ALL 4: ALARM HISTORY	OK
		REMOTE CONTROL KEYS		NONE	

*1 Available only when alarm inactivation is set to “SUSPEND ALARMS”.

*2 Available only when site is ICU or NICU and alarm inactivation is set to “SUSPEND ALARMS”.

*3 Available only when site is OR and alarm off type is “BYPASS”.

*4 Available only when site is OR.

*5 Available only when data transport setting is “ENABLE”.

*6 Available only when site is OR or ICU.

*7 Available only when site is OR or ICU and ST measurement is set to ON.

*8 Available only when site is NICU.

General Requirements for Connecting Medical Electrical Systems

When more than one electrical instrument is used, there may be electrical potential difference between the instruments. Potential difference between instruments may cause current to flow to the patient connected to the instruments, resulting in electrical shock (micro shock). Therefore, electrical instruments must be appropriately installed as specified in IEC 60601-1-1: 2000 Second edition.

The following is an extract from IEC 60601-1-1 “Medical electrical equipment Part 1-1: General requirements for safety”. For details, refer to IEC 60601-1-1 and consult with a biomedical engineer.

Examples of combinations of MEDICAL ELECTRICAL EQUIPMENT and non-medical electrical equipment

Situation No.		Medically used room: Inside the PATIENT ENVIRONMENT	Medically used room: Outside the PATIENT ENVIRONMENT	Non-medically used room	Feasible solution (See clause 19 in all situations)
1	1a Items A and B in PATIENT ENVIRONMENT	A IEC 60601 — B IEC 60601			
	1b Items A and B in PATIENT ENVIRONMENT	A IEC 60601 — B IEC XXXXX			For B: Additional protective earth or separating transformer
	1c Item A powered from specified power supply in item B in PATIENT ENVIRONMENT	A IEC 60601; B IEC XXXXX			For B: Additional protective earth or separating transformer
2	2a Item A in PATIENT ENVIRONMENT and item B in medically used room	A IEC 60601	B IEC 60601		
	2b Item A in PATIENT ENVIRONMENT and item B in medically used room	A IEC 60601	B IEC XXXXX		For B: See 19.201 and its rationale
3	3a Item A in PATIENT ENVIRONMENT and item B in non-medically used room	A IEC 60601		B IEC 60601 or IEC XXXXX	For B: See 19.201 and its rationale
		common protective earth			
	3b Item A in PATIENT ENVIRONMENT and item B in non-medically used room	A IEC 60601		B IEC 60601 or IEC XXXXX	For B: Additional protective earth or SEPARATION DEVICE
		protective earth		protective earth with potential difference	

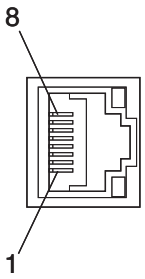
KEY TO TABLE

- Additional protective earth: If necessary, provide additional protective earthing, which is permanently connected (see also 58.201).
  NOTE: Equipment modification may be required.
- Separating transformer: If necessary, limit the ENCLOSURE LEAKAGE CURRENT, by using an additional separating transformer according to annex EEE.
  NOTE 1: No equipment modification is required.
  NOTE 2: A separating transformer is a transformer with one or more input winding(s) separated from the output winding(s) by at least basic insulation [IEC 60989].
- SEPARATION DEVICE: If necessary, apply SEPARATION DEVICE.
- IEC 60601: MEDICAL ELECTRICAL EQUIPMENT in compliance with IEC 60601.
- IEC XXXXX: Non-medical equipment in compliance with relevant IEC safety standards.

Connector Pin Assignment

MU-631R/MU-651R/MU-671R Main Unit

Network Socket

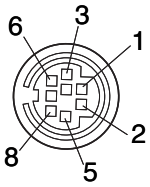


Connection cable: Network cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	TD+	5	NC
2	TD–	6	RD–
3	RD+	7	NC
4	NC	8	NC

ZS Socket



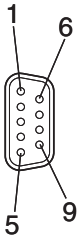
Connection cable: Transmitter cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	ZS RESP	5	ZS_XRST
2	FGND	6	ZS_XINIT
3	ZS_XCNFM	7	ZS_XRXD
4	+5 V	8	ZS_XTXD

QI-631P Interface

RS-232C Socket

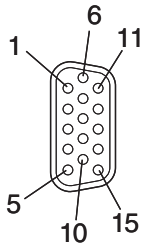


Connection cable: Serial cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Not used	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	Not used
5	GND		

RGB Socket

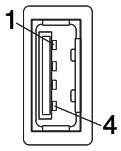


Connection cable: RGB cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	L_RED	9	5V
2	L_GREEN	10	GND
3	L_BLUE	11	Not used
4	Not used	12	Not used
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	Not used
8	GND		

QI-632P Interface

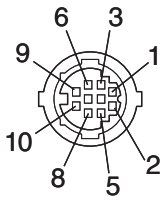


USB Socket

Connection cable: Mouse cable or bar code reader cable

Pin assignment:

No.	Signal Name
1	5 V
2	D–
3	D+
4	GND

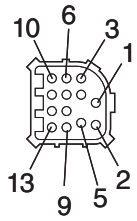


Multi-link Socket

Connection cable: Multi-link cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Tx	6	DET
2	Rx	7	Not used
3	CTS	8	+5 V
4	SYN	9	+12 V
5	xRESET	10	GND



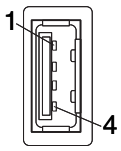
Alarm Socket

Connection cable: YJ-672P nurse call cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	D GND	8	NCALL_01
2	+12 V	9	NCALL_02
3	EXT_ALARM_R	10	NCALL_03
4	EXT_ALARM_G	11	D GND
5	EXT_ALARM_Y	12	SOUND_GND
6	EXT_ALARM_B	13	SOUND_OUT
7	NCALL_00		

QI-634P Interface

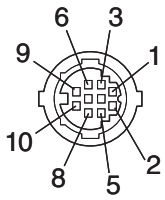


USB Socket

Connection cable: Mouse cable or bar code reader cable

Pin assignment:

No.	Signal Name
1	5 V
2	D–
3	D+
4	GND



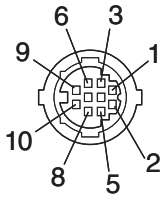
Multi-link Socket

Connection cable: Multi-link cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Tx	6	DET
2	Rx	7	Not used
3	CTS	8	+5 V
4	SYN	9	+12 V
5	xRESET	10	GND

QI-671P Interface

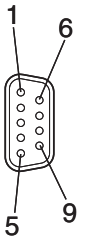


Multi-link Socket

Connection cable: Multi-link cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Tx	6	DET
2	Rx	7	Not used
3	CTS	8	+5 V
4	SYN	9	+12 V
5	xRESET	10	GND

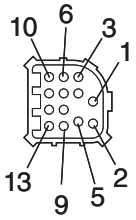


RS-232C Socket

Connection cable: Serial cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Not used	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	Not used
5	GND		

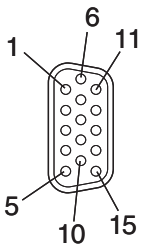


Alarm Socket

Connection cable: YJ-672P nurse call cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	D GND	8	NCALL_01
2	+12 V	9	NCALL_02
3	EXT_ALARM_R	10	NCALL_03
4	EXT_ALARM_G	11	D GND
5	EXT_ALARM_Y	12	SOUND_GND
6	EXT_ALARM_B	13	SOUND_OUT
7	NCALL_00		



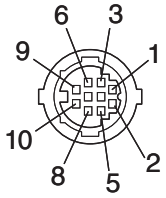
RGB Socket

Connection cable: RGB cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	L_RED	9	5V
2	L_GREEN	10	GND
3	L_BLUE	11	Not used
4	Not used	12	Not used
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	Not used
8	GND		

QI-672P Interface

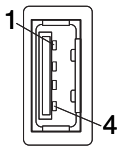


Multi-link Socket

Connection cable: Multi-link cable

Pin assignment:

No.	Signal Name	No.	Signal Name
1	Tx	6	DET
2	Rx	7	Not used
3	CTS	8	+5 V
4	SYN	9	+12 V
5	xRESET	10	GND



USB Socket

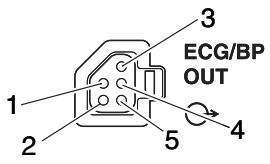
Connection cable: Mouse cable or bar code reader cable

Pin assignment:

No.	Signal Name
1	5 V
2	D–
3	D+
4	GND

AY-631P/AY-633P/AY-651P/AY-653P/AY-661P/AY-663P/AY-671P/AY-673P Input Unit

ECG/BP OUT Socket



Connection cable: YJ-910P or YJ-920P ECG/BP output cable

Pin assignment:

No.	Signal Name
1	GND
2	SHIELD
3	BP OUT
4	HT OUT
5	ECG OUT

Check Sheet for Unit Settings

Hospital Name: _____

Department: _____

Name: _____ **Date:** _____

For your record, fill in the table and check the unit setting of the central monitor and bedside monitors.

Model	Serial	Version	Unit								
			Height	Weight	ST	Temperature	Hemoglobin	Blood Pressure	CO_2	Respiration	$tcPO_2/PCO_2$
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	0g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa
			cm / inch	kg / pound	mV / mm	°C / °F	g/dL / mnol/L	mmHg / kPa	mmHg / kPa	cmH_2O / hPa	mmHg / kPa

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The model and serial number of your instrument are identified on the rear or bottom of the unit.
Write the model and serial number in the spaces provided below. Whenever you call your distributor concerning this instrument, mention these two pieces of information for quick and accurate service.

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